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Department of Employment and Training

MOICC
Massachusetts Occupational Information Coordinating Committee

Careers and Training
In the
# Allied Health Field

1989

*Michael S. Dukakis, Governor*
*Alden Raine, Secretary of Economic Affairs*
*James F. French, Commissioner of Employment and Training*

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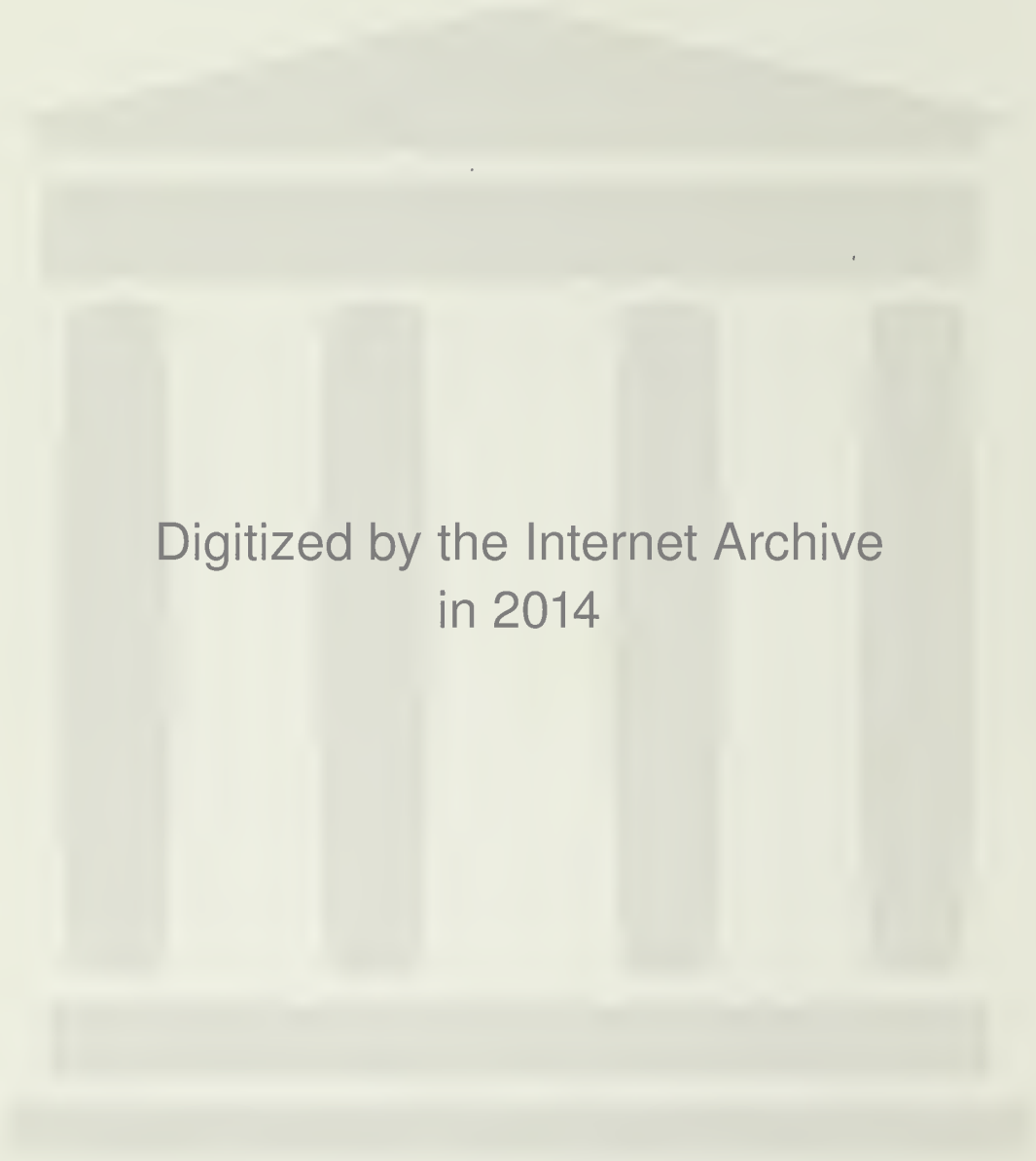
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Department of Employment and Training

Careers and Training
In the
# Allied Health Field

1989

*Dorothy R. Sullivan*

*For more information and/or additional copies, contact: The Massachusetts Occupational Information Coordinating Committee (MOICC), Charles F. Hurley Building, 2nd Floor, Government Center, 19 Staniford Street, Boston, Massachusetts 02114, Telephone: (617) 727-6718.*

## FORWARD

**Careers and Training in the Allied Health Field** was prepared under the auspices of the Massachusetts Occupational Information Coordinating Committee (MOICC) in cooperation with the Massachusetts Department of Employment and Training.

MOICC is not a major producer of labor market or occupational information, but, rather, works to improve existing data and information for program planning and occupational guidance; facilitate communication among users and producers of occupational information; and assist in identifying the types of occupational information that are needed by and are available from various groups.

MOICC is administratively located within the Department of Employment and Training and receives its goals and direction from its statutory members:

Mr. Elmer Bartels, Commissioner
Massachusetts Rehabilitation Commission

Dr. David Cronin, Associate Commissioner
Division of Occupational Education

Mr. James F. French, Commissioner
Department of Employment and Training

Working together, these individuals coordinate the development and dissemination of labor market and occupational information for planning and administering education, training, counseling, career development and job placement activities throughout the Commonwealth. The Committee hopes that this booklet will spur interest in, as well as answer questions about, career opportunities in the allied health care field.

We welcome your comments and suggestions which may be addressed to:

Massachusetts Occupational Information
Coordinating Committee
19 Staniford Street, 2nd Floor
Boston, Massachusetts 02114
617/727-6718

Robert Vinson
Executive Director
MOICC

## ACKNOWLEDGEMENTS

This second edition of Careers and Training in the Allied Health Field was written by Dorothy R. Sullivan. Ms. Sullivan artfully juggles her time between managing Labor Market Information Services within DET's Field Research Service, gathering, processing and interpreting data for a wide range of users, and developing career information products that stimulate interest and inform career decision making of young people and adults throughout the Commonwealth. For this update Ms. Sullivan researched widely and surveyed and interviewed practitioners to develop informative, accurate and interesting portraits of over twenty occupations found in the health field. Her efforts have resulted in an excellent update of one of MOICC's most popular career information products.

In addition to Ms. Sullivan, we wish to acknowledge the contributions several other individuals made to the publication of this booklet. Mr. Elliot Winer, Chief of Economic Research and Analysis, and Ms. Catherine Foley and Ms. Mary Ellen Stellar of the Occupational Employment Statistics Program provided valuable assistance in identifying current occupational staffing patterns within health care industries and in interpreting the projections data they have recently developed. Counselors at the Higher Education Information Center located at the Boston Public Library assisted in identifying schools in the state offering allied health careers instruction and patiently dealt with our many requests for information. Additionally, we express our thanks to the economists and researchers of DET's Field Research Department who were always generous with their time and expertise.

Overall guidance and support for this project was provided by Commissioner James F. French and Deputy Commissioner Richard T. Sullivan. Ann Coles, Thomas Fallon, John McDonagh, and J.P. Moriarty of the Massachusetts Occupational Information Coordinating Committee Technical Advisory Group are also to be thanked for their continued commitment to the production and wide dissemination of high quality career information products. Marilyn Boyle, Associate Director of MOICC and author of the first edition, assisted with editing and offered several helpful suggestions on format design and content.

Finally, we wish to express our special thanks to Ms. Kelly Tyler of the Field Research Department for managing production and preparing the final draft of this report.

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# INTRODUCTION

Health services is one of the fastest growing industries in Massachusetts, with over 65,000 new jobs expected by the year 2000. Many more additional opportunities will be created as individuals are promoted or leave the field. Clearly, the medical field offers bright prospects for anyone seeking a rewarding and challenging career.

Careers and Training in the Allied Health Field was first published in January, 1985. This edition has been updated to reflect the new Massachusetts occupational projections to the year 2000. Occupational wage data from the 1986 survey of the services industry is included in a new section, Occupational Earnings. Occupation/industry profile data from the 1987 Occupational Employment Statistics survey of nonmanufacturing establishments permitted the update of the Industries That Employ section. This new edition of Careers and Training in the Allied Health Field responds to numerous requests for information on the effects of advances in medical technology and of cost-containment measures on employment in allied health occupations.

This booklet presents information on twenty-eight allied health occupations. The term "allied health" is often used to describe occupations or occupational groups composed of individuals who assist, facilitate and complement the work of physicians and other specialists in the health care system. Sometimes these jobs are called "paramedical occupations", although the term allied health is more commonly used. There is no standard list of these occupations. We have chosen twenty-eight which illustrate the variety of skills, interests and patient contact to be found in careers in the health field.

Careers and Training in the Allied Health Field is intended not only for high school students who are just beginning to think about the future, but also for those who are out of school and thinking about a new career or a career change and who have always had an interest in working with and helping others. We hope this booklet will stimulate interest at the same time that it answers many of your questions about this exciting field.

## Organization of This Booklet

Each occupational description is presented in a format which provides information in the following categories:

* Nature of the Work gives a brief summary of the principal job tasks.

* Education, Training and Hiring Requirements discusses the level and type of training needed for entry into the occupation. Organizations which confer professional credentials and the state agencies responsible for occupational licensing are also cited in this section.

* Industries that Employ identifies the industries (not individual employers) which are the major employers of individuals in the occupation. This information is derived primarily from the Department of Employment and Training's Occupational Employment Statistics Program.

* Occupational Earnings provides information on wages generally earned by persons employed in the occupation. This information is derived primarily from the Department of Employment and Training's Occupational Wages Surveys.

* Employment Outlook looks at employment trends in Massachusetts affecting future career opportunities.

* Institutions Providing Training In Massachusetts lists schools and hospitals offering postsecondary programs appropriate for entry into the occupation, by certificate, diploma and bachelor/graduate degree level. Short-term training programs are not included in these listings.

* Where to Write for More Information identifies organizations and publications from which readers can obtain information about career requirements and opportunities.

An appendix supplements information presented in the individual occupational descriptions. The appendix provides an alphabetic listing of the schools cited, including their addresses and telephone numbers, brief descriptions of the allied health occupations included, and a list of the names and addresses of the Service Delivery Areas operating programs under the Job Training Partnership Act (JTPA). A listing of specific programs currently offered by the SDAs was not available at the time this booklet was being prepared, but individuals interested in finding out more about JTPA programs are encouraged to contact the SDA serving their city/town. Also provided in the appendix is a list of Opportunity Job Centers at which are located the Training and Employment Directory (TED), a self-service computer listing of training opportunities.

Please note that inclusion of any school or hospital does not constitute an endorsement of the programs being offered and, while we sought to provide accurate and complete information, errors and omissions may have occurred. School information is for the 1987-88 school year.

State Licensing

As the allied health field becomes more professionalized and as medicine as a whole gains in technological sophistication and specialization, there is a greater need to insure the competence and skill of individuals practicing in the field. Professional organizations have long served this function through credentialing. However, in recent years the state has extended medical licensing to a number of the allied health professions. Listed below are the names and addresses of agencies and boards in Massachusetts which are responsible for certifying individuals in selected allied health occupations. Requirements for state licensing are noted in the individual occupation descriptions.

Board of Registration in Dentistry
100 Cambridge Street, Room 1514
Boston, MA 02202
617/727-9928, 617/727-9929

Board of Registration for Speech-Language Pathology and Audiology
100 Cambridge Street, Room 1519
Boston, MA 02202
617/727-1747

Department of Public Health
Office of Emergency Medical Services
80 Boylston Street, Suite 1040
Boston, MA 02116
617/451-3433

Board of Registration of Allied Health Professions
100 Cambridge Street, Room 1519
Boston, MA 02202
617/727-3071

Board of Registration in Nursing
100 Cambridge Street, Room 1519
Boston, MA 02202
617/727-9961

Board of Registration of Social Workers
100 Cambridge Street, Room 1512
Boston, MA 02202
617/727-3076

The Massachusetts Occupational Information Coordinating Committee (MOICC) has prepared a **Directory of Licensed Occupations in Massachusetts** which includes licensed occupations in the health field. The **Directory** may be obtained by contacting the MOICC.

**Alternative Sources of Training**

In addition to the schools and hospitals identified in this booklet, those interested in a career in health may wish to investigate several alternative approaches to training which are discussed below.

The Armed Forces provides training and job experience in a wide variety of health occupations. The U.S. Military Entrance Processing Command has published the **Military Career Guide** which provides descriptions of 134 enlisted military occupations and 71 military officer occupations. Included in these descriptions is a section on training provided in the military. Students interested in finding out more about opportunities in the military should contact the recruiting office of the service branch of interest (Air Force, Army, Coast Guard, Marine Corps or Navy). These offices are listed in the phone book. Counselors and guidance personnel can also contact the recruiting commands and ask to speak with the Education Specialist or Education Coordinator. This individual can provide information and literature about training opportunities and requirements which can be helpful to students or clients.

Specialized short-term training is available from agencies operating programs under the Job Training Partnership Act (JTPA). Information on eligibility requirements and training opportunities under JTPA can be obtained from the Service Delivery Area (SDA) offices listed in the Appendix. Local Opportunity Job Centers of the Department of Employment and Training can also provide information on training and services offered under

JTPA and other government sponsored programs. The addresses of the OJCs are listed in the Appendix.

The Job Corps is an alternative source of job and life skills training for young persons who meet the eligibility requirements. To find out more about Job Corps write or phone: Job Corps, Employment and Training Administration, JFK Federal Building, Room 1700, Boston, MA 02203, 617/565-2179.

The Divisions (or Departments) of Continuing Education in colleges and universities offer workshops, courses and degree programs which are separate from the day programs offered by these institutions. They also vary more from year to year as these Divisions try to keep pace with community needs and changing career trends. Individuals investigating college and university programs should not neglect training opportunities available through these Divisions. The college or university can connect you with their Continuing Education department.

The National Home Study Council accredits courses and programs which have been designed to allow the student to study on his or her own. They list several accredited programs in the health field. To obtain a directory of accredited home study schools write to: National Home Study Council, 1601 18th Street, NW, Washington, DC 20009.

**Additional Sources of Information**

In addition to sources cited in each of the occupational descriptions, the publications listed below also provide excellent information on careers in the health field.

**Occupational Outlook Handbook**
1988-89 Edition, Bulletin 2300
U.S. Department of Labor
Bureau of Labor Statistics
April 1988

**Health Careers Guidebook**
Fourth Edition, 1979
U.S. Department of Labor, Employment and Training Administration
U.S. Department of Health, Education and Welfare, Health Resources Administration

**Occupational Outlook Quarterly**
U.S. Department of Labor
Bureau of Labor Statistics
Winter 1983
See article: "Medical Technology of the 1980s: Giving Birth to New Health Careers"

**Massachusetts Occupational Outlook**
First Edition, May 1989
Massachusetts Department of Employment and Training
MOICC

Information on the publications above, except the **Massachusetts Occupational Outlook**, can be obtained from: Bureau of Labor Statistics, Boston Regional Office, JFK Federal Building, Suite 1603, Boston, MA 02203, 617/565-2325. Information on the **Massachusetts Occupational Outlook** may be obtained from the Department of Employment and Training, MOICC, C.F. Hurley Building, 2nd Floor, Boston, MA 02114.

The Committee on Allied Health Education and Accreditation (CAHEA) certifies training programs in the allied health field. Information about health careers and accredited programs is available by writing to them at: American Medical Association, Department of Allied Health Education and Accreditation, 525 North Dearborn Street, Chicago, Illinois 60610.

The complete listing of all CAHEA accredited programs is available in the **Allied Health Education Directory, 17th Edition**, which can be obtained for $27.95 from AMA Book and Pamphlet Fulfillment, OP 220/9, PO Box 10946, Chicago, Illinois 60610-0946.

The Higher Education Information Center (HEIC) provides free information and counseling services on career planning, school selection, admissions, training, technical programs and financial aid. They also have an extensive library of occupational and educational information. The HEIC serves the greater Boston area on a walk-in or appointment basis, and all of Massachusetts through a telephone hotline called the Career and Learning Line. HEIC is located at the Boston Public Library, 666 Boylston Street, Copley Square. The hotline number is 617/536-0200 for Greater Boston, or toll-free at 800/442-1171 from anywhere in the state.

# OCCUPATIONAL DESCRIPTIONS

## BIOMEDICAL EQUIPMENT TECHNICIANS

Biomedical equipment technicians (BMETs) or biomedical instrumentation technicians test, adjust and repair electromedical equipment using hand tools and meters. Electromedical and bioequipment technicians develop, modify and service medical electronic equipment such as heart pacemakers, heart-lung machines, dialysis machines, CAT scanners, microscopes and defibrillators. They must thoroughly understand how each piece of equipment in their care functions. Biomedical electronics technicians take equipment apart for cleaning and oiling, reassemble and calibrate it. They inspect and test equipment using handtools, power tools and measuring devices. Biomedical equipment technicians install new equipment and may instruct medical and research staff on the proper use and care of the equipment.

## EDUCATION, TRAINING AND HIRING REQUIREMENTS

Completion of a two year associate degree program in biomedical engineering technology, electronics or a related engineering science is the minimum preparation for these technicians. Students generally study physiology, electronics, mathematics, biomedical instrumentation, chemistry, physics and basic liberal arts. Academic programs provide the general technical knowledge and understanding of the more commonly used biomedical instruments, components, systems and circuit techniques. Before BMETs are considered fully qualified, they generally complete on-the-job instruction under an experienced equipment technician or a biomedical engineer.

Technicians from other electronics or computer fields are frequently well suited for the job of biomedical equipment technician. Those persons with good skills in electronic equipment repair may enter the field through working for biomedical equipment manufacturers. Some manufacturers have training programs for persons already experienced in electronic instrumentation.

No licensing or certification is needed for employment as a technician at the present time. However, the International Certification Commission for Clinical Engineering and Biomedical Technology, with the Association of the Advancement of Medical Instrumentation serving as its Secretariat, does offer a certification program for biomedical equipment technicians. To qualify to take the necessary exams, the technician must have 2 years of BMET experience plus an associate's degree in biomedical engineering technology, or 3 years of BMET experience plus an associate's degree in electronics, or 4 years of work experience in the biomedical equipment field.

## INDUSTRIES THAT EMPLOY BIOMEDICAL EQUIPMENT TECHNICIANS

| SIC | Industry | Percentage of Occupation |
|---|---|---|
| 806 | Hospitals | 87.7% |
| 808 | Outpatient Care Facilities | 2.7 |

## OCCUPATIONAL EARNINGS

Biomedical equipment technicians earn comparable wages to electrical and electronic engineering technicians in Massachusetts. Salaries average $23,400. Entry level technicians earn about $17,000 and most experienced workers average $23,400. Nationwide salary surveys are published in the Journal of Clinical Engineering.

## EMPLOYMENT OUTLOOK

Biomedical instrumentation is a rapidly expanding field. Hospital spending for electromedical equipment is expected to continue the strong growth trends of the mid-1980s, buoyed in large part by strong demand for medical services for the increasing number of elderly patients. Growth in equipment sales is being spurred by ultrasound devices, respiratory and patient-monitoring equipment, and magnetic resonance imagers. Despite cost-containment pressures, hospital demand for less invasive diagnostic equipment will remain strong. This growing field should provide increased employment opportunities for biomedical equipment technicians. Those biomedical engineering technicians trained in diagnostic electronic imaging equipment will have the best advancement opportunities.

## RELATED OCCUPATIONS

Engineering Technicians
Science Technicians
Health Technologists and Technicians
Electronic Instrument Repairers

## INSTITUTIONS PROVIDING TRAINING IN MASSACHUSETTS

Two-Year (Associate's) Degree:

Franklin Institute of Boston
41 Berkeley Street
Boston, MA 02116
617/423-4630

Quinsigamond Community College
670 West Boylston Street
Worcester, MA 01606
508/853-2300

Springfield Technical Community College
One Armory Square
Springfield, MA 01105
413/781-7822

## WHERE TO WRITE FOR MORE INFORMATION

Association for the Advancement of Medical Instrumentation
1901 N. Fort Myer Drive, Suite 602
Arlington, VA 22209

Biomedical Engineering Society
PO Box 2399
Culver City, CA 90230

## DENTAL ASSISTANTS

Dental assistants perform a variety of laboratory, clinical and office duties. They record patients' personal information, prepare patients for treatment and schedule appointments. Dental assistants arrange and sterilize instruments, hand the dentist the proper instruments and materials and keep the patient's mouth dry and clear by using suction or other devices. Some dental assistants prepare materials for making impressions and restorations.

State laws determine which clinical tasks dental assistants may perform. In Massachusetts, dental hygienists are licensed and perform the more advanced dental assisting tasks such as teeth cleaning and fluoridation treatments.

## EDUCATION, TRAINING AND HIRING REQUIREMENTS

Dental assisting is an entry level position. In Massachusetts, most dental assistants complete training offered by community colleges, vocational-technical schools, and technical institutes. The majority of formal training programs take one year or less to complete and lead to a certificate or diploma. Graduates of two year programs offered in community colleges earn an associate degree. The minimum requirement for these training programs is a high school diploma or its equivalent. Some schools require candidates to have completed courses in English, biology (with a lab), mathematics, chemistry and typing.

Accredited dental assisting programs include classroom, laboratory and clinical affiliation. Curriculum includes oral anatomy, dental radiology, dental materials and dental sciences.

Professional certification through the Dental Assisting National Board, though usually not required, is helpful when seeking employment.

## INDUSTRIES THAT EMPLOY DENTAL ASSISTANTS

| SIC | Industry | Percentage of Occupation |
|---|---|---|
| 802 | Offices of Dentists | 97% |

## OCCUPATIONAL EARNINGS

Dental assistants generally earn from $6.00 to $7.60 an hour depending upon the number of hours worked, the size and location of their employer's dental practice, and the education and experience of the dental assistant.

## EMPLOYMENT OUTLOOK

Employment of dental assistants is expected to grow faster that the average for all occupations in Massachusetts. The demand for dental assistants is driven by an aging labor force, rising incomes and widespread dental

coverage. However, a sharp decline in patient load stemming from fluoridation and preventive dentistry could temper the expansionary forces.

## RELATED OCCUPATIONS

Medical Assistants
Chiropracter Assistants
Ophthalmic Medical Assistants
Optometric Assistants
Podiatric Assistants
Veterinary Technicians

## INSTITUTIONS PROVIDING TRAINING IN MASSACHUSETTS

Certificate Programs:

Bryman Schools
323 Boylston Street
Brookline, MA 02146
617/232-6035

Diman Regional Voc-Tech School
Stonehaven Road
Fall River, MA 02723
508/678-2891

Fanning School of Health and Technical Occupations
Wheaton Square
Worcester, MA 01608
508/799-1940

Middlesex Community College
Springs Road
Bedford, MA 01730
617/275-8910

Two-Year (Associate's) Degree:

Boston University
121 Bay State Road
Boston, MA 02146
617/353-2000

Middlesex Community College
Springs Road
Bedford, MA 01730
617/275-8910

Northern Berkshire Regional Voc-Tech
Hodges Cross Road
North Adams, MA 01247
413/663-5383

Southeastern Regional Vocational-Technical School
250 Foundry Street
South Easton, MA 02375
508/238-4374

Springfield Technical Community College
1 Armory Square
Springfield, MA 01105
413/781-7822

Montachusett Regional Voc-Tech
1050 Westminster Street
Fitchburg, MA 01420
508/345-9200

## WHERE TO WRITE FOR MORE INFORMATION

American Dental Assistants Association
666 N. Lake Shore Drive, Suite 1130
Chicago, IL 60611

Dental Assisting National Board, Inc.
216 E. Ontario Street
Chicago, IL 60611

Commission on Dental Accreditation
American Dental Association
211 E. Chicago Ave., Suite 1814
Chicago, IL 60611

## DENTAL HYGIENISTS

Dental hygienists are oral health clinicians who aid the public in developing and maintaining good oral hygiene. Dental hygienists may perform preventive and therapeutic treatment under the supervision of a dentist. They perform such duties as cleaning and polishing teeth, applying fluoride treatments, taking, exposing and developing X-rays, providing dental health education, and maintaining patients' records.

Depending on legal requirements in the state where they work, dental hygienists may evaluate the patient's dental health; remove calculus, stain and plaques from above and below the gumline; apply cavity-preventive agents such as fluorides and pit and fissure sealants; instruct patients on plaque control and the use of floss threaders; place temporary fillings and periodontal dressings; remove sutures; and polish and recontour amalgam restorations.

## EDUCATION, TRAINING AND HIRING REQUIREMENTS

Dental hygienists must be licensed by the state in which they plan to practice. To qualify for licensure in Massachusetts, the candidate must be a graduate of an approved school or program of dental hygiene (2-4 years), pass a clinical exam offered 3 times per year by the Northeast Regional board, pass the written examination of the American Dental Association Joint Commission on National Central Examinations and pass an examination on the legal and ethical aspects of dental hygiene practice.

Completion of an associate degree program is sufficient for the dental hygienist who wants to practice in a private dental office. A bachelor's or more advanced degree is usually required for research or for employment in public or school health programs. Dental hygienists with a master's degree are qualified for teaching or administrative positions in dental hygiene educational programs.

For admission into a dental hygiene program, most schools prefer applicants who have completed at least one year of college, and several programs require applicants to have completed two years. Among high school courses recommended for dental hygiene program candidates are biology, health, chemistry, psychology, speech and mathematics.

## INDUSTRIES THAT EMPLOY DENTAL HYGIENISTS

| SIC | Industry | Percentage of Occupation |
|---|---|---|
| 802 | Offices & Clinics of Dentists | 99.0% |

## OCCUPATIONAL EARNINGS

Dental hygienists generally earn from $19,000 to $25,000 a year depending upon the number of hours worked, the size and location of their employer's dental practice, and the education and experience of the hygienist.

## EMPLOYMENT OUTLOOK

Employment of dental hygienists is expected to grow much faster than average as the demand for dental care increases, stimulated by population growth, rising real incomes, growing public awareness of the importance of oral health, and the fairly widespread availability of dental insurance. Changing patterns of dental practice, which encourage the use of support staff, should also contribute to the demand for hygienists.

Additional job openings for dental hygienists will result from the need to replace workers who leave the occupation. However, if the increasing supply of dentists leads to smaller patient loads, dentists may choose to perform more services themselves and hire fewer replacement hygienists.

## RELATED OCCUPATIONS

Dental Assistants
Ophthalmic Medical Assistants
Podiatric Assistants
Office Nurses
Medical Assistants
Physician Assistants

## INSTITUTIONS PROVIDING TRAINING IN MASSACHUSETTS

Two-Year (Associate's) Degree:

Bristol Community College
777 Elsbree Street
Fall River, MA 02720
508/678-2811

Cape Cod Community College
Route 132
West Barnstable, MA 02668
508/362-2131

Forsyth School for Dental Hygienists
140 The Fenway
Boston, MA 02115
617/262-5200

Middlesex Community College
Springs Road
Bedford, MA 01730
617/275-8910

Quinsigamond Community College
670 West Boylston Street
Worcester, MA 01606
508/853-2300

Springfield Technical Community College
One Armory Square
Springfield, MA 01105
413/781-7822

## WHERE TO WRITE FOR MORE INFORMATION

Division of Professional Development
American Dental Hygienists Assoc.
444 North Michigan Ave., Suite 3400
Chicago, IL 60611

Commission on Dental Accreditation
American Dental Association
211 East Chicago Avenue
Chicago, IL 60611

Division of Dental Health
Public Health Service
U.S. Dept. of Health & Human Services
Washington, DC 20201

## DIAGNOSTIC MEDICAL SONOGRAPHERS

Diagnostic medical sonographers or ultrasound technicians operate equipment which makes use of sonic energy to show the contours and composition of body tissues to assist physicians in diagnosis and treatment. They use equipment that generates high-frequency sound waves to produce reflected echoes when directed at the internal organs of the body. These echoes produce images on a monitor (TV screen) which show the shape and composition of body parts. The amount of time it takes for the echoes to return, along with their strength, provides information on size, shape, consistency and distance between the internal organs imaged. The sonographers view these images on a screen. Simultaneously, they record the images on a continuous paper readout and photograph the screen for a permanent record. Magnetic resonance imaging works in much the same way but uses magnetic fields in place of sound waves.

Sonography is used to provide diagnosis in scanning the brain and heart, fetal monitoring and detecting detached retinas or internal hemorrhaging of the eyes. It is used to detect vascular problems, measure the flow of blood in the heart and the accumulation of fluid in the abdomen.

In assisting physicians in gathering sonographic data, diagnostic medical sonographers obtain, review and integrate pertinent patient history and supporting clinical data. Sonographers select equipment appropriate for use in ultrasound tests ordered by physicians. Ultrasound technicians explain the procedure to the patient. Then, they position the patient and apply a conducting gel to the body surface. Ultrasound technicians move a scanning device over the patient's body, frequently checking the monitor to maintain image clarity and to note the position, obstruction or change of shape or density of any organ. In addition, diagnostic medical sonographers record and process sonographic data and other pertinent observations made during the procedure such as the patient's position and equipment.

## EDUCATION, TRAINING AND HIRING REQUIREMENTS

Programs in diagnostic medical sonography may be one, two or four years in duration, depending on program design, objectives and the degree or certificate awarded. Hospital based training programs of one year's duration lead to a certificate. Graduates of two year community college programs are awarded an associate degree. Four year college or university programs lead to a bachelor of science degree. Except for the university programs which accept high school graduates with a strong math/science background, all other programs accept candidates already trained in a clinically related allied health profession. Certificate programs also attract experienced radiologic technologists who want to specialize in ultrasound technology. Magnetic resonance imaging (MRI) is a new field, and no formal programs have yet been developed to prepare technologists to operate MRI scanners. Most training is provided to experienced radiologic technologists by hospitals and equipment manufacturers.

There are 34 CAHEA (Committee on Allied Health Education and Accreditation) accredited programs for diagnostic medical sonographers, two of which are located in Massachusetts. Curricula of accredited programs include physical sciences, applied biological sciences, patient care, clinical medicine,

applications of ultrasound, instrumentation, related diagnostic procedures, and image evaluation. Integral to sonography training programs is a competency based clinical education.

There are no requirements that sonographers be licensed or certified. In practice, hospitals generally require CAHEA-accredited training. The American Registry of Diagnostic Medical Sonographers (ARDMS) certifies the competence of ultrasound technologists after passage of both a written and a practical exam.

## INDUSTRIES THAT EMPLOY DIAGNOSTIC MEDICAL SONOGRAPHERS

| SIC | Industry | Percentage of Occupation |
|---|---|---|
| 806 | Hospitals | INA |
| 808 | Outpatient Care Facilities | INA |

## OCCUPATIONAL EARNINGS

According to a 1988 survey of program directors, salaries of entry level diagnostic medical sonographers averaged $24,743. The supply and demand ratio affects salaries, which are dependent upon the experience requirements, job duties and geographical location. Entry level salaries in the northeast United States average $26,500.

## EMPLOYMENT OUTLOOK

Applications of diagnostic ultrasound are expected to grow very rapidly, in cardiology and obstetrics/gynecology in particular. Because ultrasound is non-invasive and relatively low-cost, its applications are expected to spread. Advances in biomedical electronic imaging are increasing the utilization of ultrasound and magnetic resonance imaging (MRI) as diagnostic tools. Diagnostic medical sonographers are likely to find employment in a wide range of health care settings, including offices of physicians, clinics, diagnostic imaging centers, health maintenance organizations and hospitals. Because many radiologic technologists have been trained in sonography, individuals trained exclusively in ultrasound techniques may face competition in career advancement.

## RELATED OCCUPATIONS

Radiologic Technologists
Cardiology Technologists
Nuclear Medicine Technologists
Cardiopulmonary Technologists
Magnetic Resonance Imaging Technologists
Positron Emission Scanning Technologists
Cardiovascular Technologists
Perfusionists
Respiratory Technologists
Clinical Laboratory Technologists
Electrocardiograph Technicians
Electroencephalographic Technologists

## INSTITUTIONS PROVIDING TRAINING IN MASSACHUSETTS

Certificate:

Massachusetts General Hospital
32 Fruit Street
Boston, MA 02114
617/726-3097

Two-Year (Associate's) Degree:

Middlesex Community College
Springs Road
Bedford, MA 01730
617/275-8910

## WHERE TO WRITE FOR MORE INFORMATION

Society of Diagnostic Medical Sonographers
10300 N. Central Expressway
Building 1, Ste. 276
Dallas, TX 74231

American Registry of Diagnostic Medical Sonographers
32 E. Hollister Street
Cincinnati, OH 45219

## DIETITIANS AND NUTRITIONISTS

Dietitians, sometimes called nutritionists, counsel sick and well individuals and groups about their diet and food selection; set-up and supervise food service systems for institutions such as hospitals, nursing homes and schools; and promote sound eating habits through education and research. Major areas of specialization include clinical and community services, employing most dietitians and involving direct patient contact, and administration and research.

Clinical dietitians, who provide nutritional services for patients in hospitals, nursing homes, clinics, or doctors' offices, are sometimes called therapeutic dietitians, a term that draws attention to the fact that they are chiefly concerned with treating the sick.

Increasingly, clinical dietitians specialize in such areas as management of obese patients, care of the critically ill, cardiac care, renal care and diabetes care. Their duties include the communication of dietetic restrictions, establishing long-term nutritional care programs and systems for close monitoring and preparation of custom-mixed, high-nutrition formulas.

Community dietitians counsel individuals and groups on sound eating practices to prevent disease and to promote good health. Employed in such places as home health agencies, health maintenance organizations, and human service agencies that provide group and home-delivered meals, their job is to evaluate individual needs, establish nutritional care plans, and communicate the principles of good nutrition in a way individuals and their families can understand. Due to increased interest in good health, nutrition and fitness, employment opportunities for clinical and community dietitians are becoming more diverse. This new awareness has resulted in opportunities for private practitioners in industries such as food manufacturing, advertising, publishing and marketing.

Administrative dietitians are responsible for large-scale meal planning and preparation in such places as hospitals, company cafeterias, prisons, schools and colleges and universities. Dietitians supervise the planning, preparation and service of meals; select, train and direct food service supervisors and workers; budget for and purchase food, equipment and supplies; and enforce sanitary and safety regulations.

Research dietitians usually are employed in academic medical centers or educational institutions although some work in community and public health programs. Their research ranges from basic science to practical applications. Using established research methods and analytical techniques, research dietitians study issues such as the nutritional needs of persons with particular diseases and behavior modification as it relates to diet and nutrition.

## EDUCATION, TRAINING AND HIRING REQUIREMENTS

A bachelor's degree with a major in foods and nutrition or institution management is the basic educational requirements for this field. In addition to basic educational requirements, required college courses include

foods, nutrition, institution management, chemistry, microbiology and physiology. A graduate degree is usually needed for those wishing to advance to higher level positions in teaching and research. Public health nutritionists usually must earn a graduate degree. To those interested in administrative dietetics, graduate study in institutional or business administration is valuable.

To qualify for professional credentials as a Registered Dietitian, the American Dietetic Association (ADA) recommends completion of a 4-year coordinated undergraduate program which includes an internship; completion of a bachelor's degree from an approved program plus an accredited dietetic experience; or a master's degree from an approved program plus 6 months' approved work experience. Internships last 6 to 12 months and combine clinical experience under a qualified dietitian with some classroom work.

Clinical specialization offers another path to career advancement. Specialty areas for clinical dietitians include heart disease, kidney disease, diabetes, cancer, pediatrics and gerontology.

## INDUSTRIES THAT EMPLOY DIETITIANS AND NUTRITIONISTS

| SIC | Industry | Percentage of Occupation |
|---|---|---|
| 806 | Hospitals | 42.1% |
| 805 | Nursing and Personal Care Facilities | 23.9 |
| 808 | Home Health Care Services | 8.4 |
| 821 | Elementary and Secondary Schools | 3.9 |

## OCCUPATIONAL EARNINGS

Salaries range widely for dietitians depending upon their education and experience and the geographic location and the type of industry of their employers. Wages for dietitians range from $16,000 to about $35,000 a year, although starting salaries can begin as low as $7,000. Experienced dietitians can earn as high as $45,000 a year. Hospitals' average hourly rates were $11.45 or $23,820 a year (based on a 40-hour work week, 52 weeks) according to the 1987 Massachusetts Hospital Survey.

## EMPLOYMENT OUTLOOK

Employment in this field is expected to grow faster than average to meet the expanding needs of nursing homes, hospitals, retirement and life care communities, and social service programs. Catering firms, restaurant chains and medical supply firms also offer favorable job prospects.

Opportunities will be best for individuals with experience and for those willing to relocate to areas of greatest demand.

## RELATED OCCUPATIONS

Food and Home Economists
Food Service Managers
Health Educators

## INSTITUTIONS PROVIDING TRAINING IN MASSACHUSETTS

Four-Year (Bachelor's) Degree:

Framingham State College
120 State Street
Framingham, MA 01701
508/620-1220

University of Massachusetts-Amherst
255 Whitmore
Amherst, MA 01003
413/545-0222

Simmons College
300 The Fenway
Boston, MA 02115
617/738-2107

Two-Year (Associate's) Degree:

Essex Agricultural and Technical Institute
Collegiate Division
Route 62
Danvers, MA 01923
508/774-0050

Catherine Laboure College
2120 Dorchester Avenue
Boston, MA 02124
617/296-8300

Holyoke Community College
303 Homestead Avenue
Holyoke, MA 01040
413/538-7000

## WHERE TO WRITE FOR MORE INFORMATION

The American Dietetic Association
430 North Michigan Avenue
Chicago, ILL 60611

American Institute of Nutrition
9650 Rockville Pike
Bethesda, MD 20014

## ELECTROCARDIOGRAPH (EKG) TECHNICIANS

Electrocardiograph (EKG) technicians operate equipment which records the electrical activity of the heart to assist physicians in detecting heart irregularities or disease. Electrocardiograms (EKGs) are graphic tracings of heartbeats recorded by an instrument called an electrocardiograph on a narrow strip of paper or on a video screen. The test is done to help diagnose certain forms of heart disease, monitor the effects of drug therapy, analyze changes in the condition of a patient's heart over time and to establish a baseline cardiac profile before most kinds of surgery.

After explaining the procedure to the patient, the EKG technician attaches 10 electrodes to the chest, arms and legs of the patient. Normally, the technician applies a gel between the electrodes and the patient's skin to facilitate the passage of the electrical impulses. By adjusting switches on the electrocardiograph and positioning the electrodes across the chest, the technician obtains a recording of the heart's electrical action. A stylus or inkpen records the tracings on graph paper. The technician observes dials, graphs and screens during the tests.

After the recording is completed, the technician prepares the electrocardiogram for analysis by a physician, usually a cardiologist. The most advanced EKG equipment employs a computer to analyze the tracing. The technician may need to enter information into the console using a keyboard. Technicians must be able to recognize and correct technical errors such as incorrect lead placements or electrical interference, that prevent an accurate reading. They also must call to the physician's attention any significant deviation from the average normally recorded by the technique used. Technicians need special training to perform 24-hour ambulatory monitoring and exercise stress testing.

## EDUCATION, TRAINING AND HIRING REQUIREMENTS

EKG technicians usually are trained on the job. Training, which is usually conducted by an EKG supervisor or a cardiologist, lasts from 4 to 6 weeks for the basic "resting" EKG. Classroom instruction typically includes diagnostic procedures, operation and maintenance of diagnostic equipment, preparation of patients for testing and methods of cardiopulmonary resuscitation. Training for specialized EKG testing such as Holter monitoring, stress testing and echo cardiography is much more extensive-usually 12 to 24 months - and involves in-depth study of cardiovascular anatomy and physiology. A high school diploma is generally required for entry into these programs. High school courses recommended for students interested in this field include health, biology and typing.

The National Board of Cardiovascular Testing, Inc. offers voluntary credentials which are an asset when seeking employment. Opportunities for advancement are good for technicians who become proficient in more complex and sophisticated cardiovascular and cardiopulmonary system testing.

## INDUSTRIES THAT EMPLOY ELECTROCARDIOGRAPH (EKG) TECHNICIANS

| SIC | Industry | Percentage of Occupation |
|---|---|---|
| 805 | Hospitals | 99% |

## OCCUPATIONAL EARNINGS

Most EKG technicians earned starting salaries of about $13,000 nationally in 1986. EKG technicians who performed more sophisticated tests were paid more than those who performed only basic ones. Some experienced EKG technicians earned almost $25,000 a year.

## EMPLOYMENT OUTLOOK

Employment of EKG technicians is expected to grow about as fast as the average for all occupations due to anticipated growth in cardiology. Demand for technicians will be tempered by increased equipment productivity due to computerization and advanced technology and cost-containment efforts at streamlining hospital staffing. Most job openings, therefore, will result from the need to replace technicians who transfer to other jobs or leave the labor force altogether.

## RELATED OCCUPATIONS

Audiometrists
Electroencephalographic (EEG) Technologists and Technicians
Radiologic Technologists
Clinical Laboratory Technologists and Technicians
Cardiovascular Technologists
Cardiopulmonary Technologists
Electroneurodiagnostic Technicians

## INSTITUTIONS PROVIDING TRAINING IN MASSACHUSETTS

Two-Year (Associate's) Degree:

Middlesex Community College
Springs Road
Bedford, MA 01730
617/275-8910

## WHERE TO WRITE FOR MORE INFORMATION

American Cardiology Technologists Association, Inc.
1980 Isaac Newton Square South
Reston, VA 22090

National Alliance of Cardiovascular Technologists
5 West Hargett Street, Suite 1100
Raleigh, NC 27601

National Center for Cardiovascular and Cardiopulmonary Technology
1133 15th Street, NW, Suite 1000
Washington, DC 20005

National Board of Cardiovascular Testing, Inc.
5 Cold Hill Road, South, Suite A-2,
Box 158
Mendham, NJ 07945

Cardiovascular Credentialing International
2801 Far Hills, #309
Dayton, OH 45419

## ELECTROENCEPHALOGRAPHIC (EEG) TECHNOLOGISTS AND TECHNICIANS

Electroencephalographic (EEG) Technician/Technologists operate equipment which records the electrical activity of the brain to assist physicians in the diagnosis and treatment of brain disease or injury. An instrument called an electroencephalograph records this electrical activity and produces a written tracing of the brain's electrical impulses on a continuous graph. This record of brain waves, an electroencephalogram (EEG), can be taken while patients are at rest or asleep, while they are subjected to stimuli such as loud sounds or pulsating lights, or during periods of exaggerated breathing.

Neurologists use electroencephalograms, a basic diagnostic tool in the area of neurology, to help diagnose the extent of injury for patients suspected of having head trauma, brain tumors, strokes, metabolic thoraic disorders or epilepsy. They use the EEG to evaluate the effects of infectious diseases such as meningitis on the brain and to determine whether individuals with mental or behavioral problems have an organic impairment. Surgeons use them to monitor the patient's condition during major surgery. EEGs are standard in intensive care units as well, since absence of electrical activity in the brain is a basis for determining that a patient is "clinically" dead, or is used to assess the likelihood for recovery of patients from a coma.

More sophisticated equipment is used for special EEG procedures, including ambulatory monitoring, evoked potential studies, sleep studies and brain wave mapping. Tests such as these improve the physician's ability to detect the underlying reasons for a wide variety of troubling conditions such as dizzy spells, sudden blackouts, tremors and sleep disorders. Brain wave mapping involves the use of computer-generated images of brain function; it is simply an enhancement of the EEG, in which a color-coded picture shows the intensity and frequency of brain waves in different areas of the brain.

Before electroencephalograms are produced, EEG technologists take a short medical history and help the patients relax. Then they place electrodes on designated spots on the patient's scalp and make sure that the instruments are working correctly. The technologists chooses the most appropriate combination of instrument controls and electrodes to produce the kind of record needed. Technologists must recognize and correct any electrical or mechanical interferences that appear. Mechanical problems are reported to the supervisor, so that the machine can be repaired promptly.

Special procedures may require that the electrodes be secured on the chest, arm, leg or spinal column as well, to record activity from both the central and peripheral nervous systems. In the procedure known as ambulatory monitoring, a small recorder may be fastened to the patient's side. Evoked potential testing may require the technologist to use a special machine to measure sensory and physical response to specific stimuli such as strobe lamps.

Technologists must know how to recognize changes in the patient's neurologic, cardiac and respiratory status. To react properly in an emergency, they must understand the kinds of medical emergencies that can occur while they are taking the EEG. For example, if a patient suffers an

epileptic seizure in the EEG laboratory, the technologist must be prepared to take the proper action.

## EDUCATION, TRAINING AND HIRING REQUIREMENTS

Many EEG technologists learn their skills on the job in hospitals and clinics. Applicants for trainee positions in hospitals generally need a high school diploma. Often, EEG trainees transfer to the neurology department from other jobs in the hospital, such as laboratory aide.

Formal training is offered at the postsecondary level by hospitals, medical centers, community colleges, vocational-technical institutes and colleges and universities. The Committee on Allied Health, Education and Accreditation approves formal training programs for EEG personnel. Programs usually last from 1 to 2 years and include laboratory experience as well as classroom instruction in neurology, anatomy, neuroanatomy, physiology, neurophysiology, clinical and internal medicine, psychiatry and electronics and instrumentation.

Professional credentialing is available through the American Board of Registration of Electroencephalographic Technologists (ABRET), which awards the title "Registered EEG Technologist" to qualified applicants. ABRET also accredits technologists in the subspecialty of evoked potential as "Registered Evoked Potential Technologist". Registration is an asset for those seeking employment or advancement to supervisory or teaching jobs. Candidates for training in this occupation should take courses in health, biology, human anatomy and mathematics.

EEG personnel in large hospitals can advance to chief EEG technologist under the supervision of a physician - an electroencephalographer, neurologist or neurosurgeon. The chief EEG technologist takes on increased responsibilities in laboratory management and in teaching basic techniques to new personnel or students from EEG training programs.

## INDUSTRIES THAT EMPLOY EEG TECHNOLOGISTS AND TECHNICIANS

| SIC | Industry | Percentage of Occupation |
|---|---|---|
| 801 | Offices of Physicians | 16% |
| 806 | Hospitals | 68 |
| 807 | Medical and Dental Laboratories | 16 |

## OCCUPATIONAL EARNINGS

Salaries of EEG technologists average about $14,700 a year nationally. Starting salaries for registered EEG technologists are $1,000 to $2,000 higher. Salaries of experienced EEG technologists range as high as $20,000 a year.

## EMPLOYMENT OUTLOOK

Employment of EEG technologists is expected to grow as fast as the average for all occupations, because of increasing application of the EEG and

related neurodiagnostic tests, and the willingness of health insurers and other third-party payers to cover such examinations. Nonetheless, most job openings will result from the need to replace workers who transfer to other occupations or leave the labor force entirely.

Continued acceptance of the value of the EEG is expected to sustain demand for the workers who perform these tests. Increased survival from major trauma and further advances of neurophysiology are likely to spur demand by expanding the use of neurodiagnostic testing.

## RELATED OCCUPATIONS

Audiometrists
Electrocardiograph Technicians
Clinical Laboratory Technicians
Occupational Therapy Assistants
Physical Therapy Aides
Psychiatric Aides
Surgical Technicians

## INSTITUTIONS PROVIDING TRAINING IN MASSACHUSETTS

Two-Year (Associate's) Degree:

Catherine Laboure College
2120 Dorchester Avenue
Boston, MA 02124
617/296-8300

## WHERE TO WRITE FOR MORE INFORMATION

Executive Office
American Society of
Electroneurodiagnostic
Technologists, Inc.
Sixth at Quint
Carrol, IA 51401

American Board of Registry for EEG
Technology
c/o Betty Rasor
University of California
Davis Medical Center EEG Lab
2315 Stockton Blvd.
Sacramento, CA 95817

Joint Review Committee for the
Accreditation of EEG Technology
Training Programs
19 Silver Mine Road
New Canaan, CT 06840

## EMERGENCY MEDICAL TECHNICIANS

Emergency medical technicians are trained to provide prompt, appropriate and efficient care to a victim of an accident, sudden illness, or trauma prior to and during transportation to a medical facility. The emergency medical technicians (EMTs) respond to calls for emergency medical assistance in cases of illness or injury. Most EMTs staff ambulances responding to emergencies. A call from a dispatcher sends EMTs to the scene of the emergency. Upon arriving at the scene, EMTs assess the patient's condition and provide medical and other pre-hospital care measures. Operating under strict guidelines, EMTs give appropriate emergency care, including opening airways, restoring breathing, controlling bleeding, treating for shock, immobilizing fractures, assisting in childbirth, and treating and giving initial care to poison and burn victims.

EMTs are trained to distinguish one kind of an emergency from another. Often, the situation is serious enough to require a radio report directly to the hospital about the nature and the extent of injuries or illness. EMTs may then be instructed by the hospital emergency staff to transmit vital signs and other information so that they can determine what treatment the EMTs should provide.

When patients need to be transported to a hospital, EMTs place them on stretchers or other patient-handling devices, carry them to the ambulance and lift them in, and then secure both patient and stretcher for the trip. On the way to the hospital, EMTs monitor the patient's vital signs and give additional care as needed or as directed by a physician with whom they have remained in radio contact.

EMTs also must keep their ambulances properly supplied and equipment in good working order. They may decontaminate the interior of the ambulance and may seek special experts to remove radiation caused by contamination.

In addition to the basic EMT, there are two other levels of EMTs, known in most places as EMT-Intermediates and EMT-Paramedics. In addition to the skills practiced by basic EMTs, Intermediates and Paramedics receive additional training so that they may administer intravenous fluids, insert special breathing devices and apply anti-shock trousers. EMT-Paramedics may use cardiac defibrillators and administer some medications. EMT-Paramedics are responsible for exercising personal judgement when communication failures interrupt contact with medical direction, or, in cases of immediate life threatening conditions, when such emergency care has been specifically authorized in advance.

## EDUCATION, TRAINING AND HIRING REQUIREMENTS

Emergency medical technicians must be licensed to practice in Massachusetts. Instruction in an approved EMT course (minimum 100 classroom and 10 in-hospital hours) that meets federal Department of Transportation (DOT) curriculum standards is required. The 110-hour program approved by the Office of Emergency Medical Services (OEMS) provides instruction and practice in dealing with emergencies such as bleeding, fractures, airway obstruction, cardiac arrest and emergency childbirth. Students learn to use

and care for common emergency equipment such as backboards, suction devices, splints, oxygen delivery systems and stretchers.

EMT-Intermediates have basic EMT training plus some of the EMT-Paramedic course material. In Massachusetts, EMT-Intermediates complete an OEMS approved EMT-Intermediate course with classroom, clinical and field components, based on the federal DOT curriculum. Typically, this instruction includes patient assessment as well as the use of esophageal airways, intravenous fluids and anti-shock garments.

Training programs for EMT-Paramedics generally last an average of 9 months. The American Medical Association's Committee on Allied Health Education and Accreditation accredits EMT-Paramedic programs that meet its standards. Some programs are designed as a part-time study model while others are organized as full-time collegiate curricula. The OEMS approved EMT Paramedic course includes classroom, clinical and field components that meet federal DOT Paramedic standards.

In Massachusetts, applicants for licensing with the Office of Emergency Medical Services must be 18 years of age minimum, able to read and write effectively in English, have a valid driver's license, be able to lift and carry 100 pounds, abstain from abuse of drugs and be free from any physical or mental impairment or disease which could jeopardize the health and safety of the patient.

Graduates of approved EMT training programs who meet certain experience requirements and pass a written and practical examination administered by the National Registry of Emergency Medical Technicians earn the title of Registered EMT-Ambulance. The level of registration for EMT-Intermediate is above that for basic EMTs, but below that for EMT-Paramedics. Prerequisites for taking the EMT-Intermediate examination include registration as EMT-A, 35 to 55 additional hours of classroom work, and a specific amount of clinical experience and field internship. The examination covers the first part of the EMT-Paramedic training curriculum and builds upon the basic EMT skills levels.

Registration for EMT-Paramedics by the National Registry of Emergency Medical Technicians requires current registration or state certification as an EMT-Ambulance, successful completion of an EMT-Paramedic training program, 6 months of field experience as an EMT-Paramedic and passage of a written and practical examination.

**INDUSTRIES THAT EMPLOY EMERGENCY MEDICAL TECHNICIANS**

| SIC | Industry | Percentage of Occupation |
|---|---|---|
| 410 | Private Ambulance Services | 39% |
| 808 | Hospitals | 22 |
| 999 | Local Government | 38 |

## OCCUPATIONAL EARNINGS

According to a survey conducted by the Journal of Emergency Medical Services (JEMS), average earnings in 1987 were $18,700 for an EMT-Ambulance (basic); $18,800 for an EMT-Intermediate; and $24,300 for an EMT-Paramedic. A 1988 national survey of program directors revealed entry-level salaries average $18,598 per year for emergency medical technicians-paramedics.

## EMPLOYMENT OUTLOOK

Employment of EMTs is expected to grow about as fast as the average of all occupations. Conflicting forces will shape demand for these workers. On the one hand, population growth in the number of elderly is expected to lead to more demand for the services of EMTs. In some localities, taxpayers have come to regard emergency medical services as a basic municipal service - as essential as police and fire protection.

Other factors are likely to constrain job growth, however. Of foremost importance is the rising cost of training and equipment. Cost containment by hospitals and municipalities will doubtless remain a concern of emergency medical service providers.

In addition to job openings created by expansion of emergency medical services, many additional openings will occur because of replacement needs. Turnover reflects the stress, physical stamina requirements, the heavy responsibility the work entails and the modest pay.

## RELATED OCCUPATIONS

Police Officers
Firefighters
Registered Nurses

## INSTITUTIONS PROVIDING TRAINING IN MASSACHUSETTS

Certificate Programs

Belchertown State School
PO Box 486
Belchertown, MA 01047
413/323-6311

Berkshire Community College
West Street
Pittsfield, MA 01201
413/499-4660

Berkshire Medical Center
725 North Street
Pittsfield, MA 01201
413/447-2000

Boston City Hospital
818 Harrison Ave.
Boston, MA 02118
617/424-5000

Mt. Auburn Hospital
330 Mt. Auburn St.
Cambridge, MA 02238
617/492-3500

Northeastern University
360 Huntington Ave.
Boston, MA 02115
617/437-2101

Emerson Hospital
Old Road to 9 Acre Rd.
Concord, MA 01742
508/369-1400

Bristol Community College
777 Elsbree St.
Fall River, MA 02720
508/528-9100

Bunker Hill Community College
New Rutherford Ave.
Charlestown, MA 02129
617/241-8600

Marlborough Hospital
57 Union St.
Marlborough, MA 01752
508/485-1121

Mass. Maritime Academy
Taylors Point
Buzzards Bay, MA 02532
508/759-5761

Middlesex Community College
Springs Road
Bedford, MA 01730
617/275-8910

Catherine Laboure College
2120 Dorchester Ave.
Boston, MA 02124
617/296-8300

Leonard Morse Hospital
67 Union St.
Natick, MA 01760
508/653-3400

North Shore Community College
3 Essex St.
Beverly, MA 01915
508/922-6722

Quincy Hospital
114 Whitwell
Quincy, MA
617/773-6100

Quinsigamond Community College
670 W. Boylston St.
Worcester, MA 01606
508/853-2300

University of Lowell
1 University Ave.
Lowell, MA 01854
508/452-5000

**WHERE TO WRITE FOR MORE INFORMATION**

National Registry of Emergency Medical Technicians
PO Box 29233
Columbus, OH 43229

National Assoc. of Emergency Medical Technicians
9140 Ward Parkway
Kansas City, MO 64114

Division of Allied Health Education and Accreditation
American Medical Association
535 N. Dearborn St.
Chicago, IL 60610

Massachusetts Dept. of Public Health
Office of Emergency Medical Services
150 Tremont St., 8th Flr.
Boston, MA 02111

## LICENSED PRACTICAL NURSES (LPNs)

Licensed Practical Nurses (LPNs) provide direct care to people who are physically or mentally ill. LPNs who work in hospitals provide bedside care to patients, usually working with physicians and registered nurses (RNs). LPNs may be responsible for a range of procedures - administering medication, changing dressings, recording temperatures or blood pressure readings, helping to deliver babies, or assisting in an intensive care unit. LPNs perform similar tasks in doctors' offices and clinics and provide patient care in private homes as well. In addition to direct care, LPNs teach patients and their families about the treatment and care needed and can delegate duties to hospital attendants and aides. Some LPNs work as private duty nurses and thus have greater flexibility in scheduling work hours.

Historically, LPNs have had limited opportunities for advancing within or outside of the occupation, although many broaden their job skills and take on new responsibilities through clinical experience or continuing education programs. Some return to school in order to become RNs.

## EDUCATION, TRAINING AND HIRING REQUIREMENTS

LPNs in Massachusetts, as in all states, must complete an approved training program that includes classroom work and clinical training. Most LPN certificate/diploma programs in Massachusetts last at least ten months, and most are offered at vocational schools, community colleges and hospitals. The relatively short time required and the low cost of LPN training make this occupation accessible to people without the resources to go into a four-year program. In order to practice, LPNs must also pass an examination to become licensed with the Board of Registration in Nursing in Massachusetts.

## INDUSTRIES THAT EMPLOY LICENSED PRACTICAL NURSES

| SIC | Industry | Percentage of Occupation |
|---|---|---|
| 806 | Hospitals | 52.6% |
| 805 | Nursing and Personal Care Facilities | 25.9 |
| 801 | Offices and Clinics of Medical Doctors | 4.7 |
| 821 | Elementary and Secondary Schools | 4.1 |
| 736 | Personnel Supply Services | 3.7 |
| 902 | State Government | 2.2 |
| 836 | Residential Care | 1.5 |
| 901 | Federal Government | 1.3 |
| 808 | Home Health Care Services | 1.1 |

## OCCUPATIONAL EARNINGS

Most LPNs earn between $16,000 and $21,000 per year. LPN wages are generally higher in hospitals than in nursing homes.

## EMPLOYMENT OUTLOOK

The employment outlook for LPNs is expected to be fairly good over the next ten years. Job growth in this occupation is likely to take place primarily in nursing homes and personal care facilities, as well as in private duty nursing. Growing demand for home health care may also provide new opportunities for LPNs.

The outlook for LPNs in the hospital sector is not clear. Hospitals may gradually replace LPN positions with RNs, in part because of a growing emphasis on acute care and sophisticated medical technologies; or hospitals may adjust staffing patterns in order to utilize LPNs with valuable clinical experience. In the near term, because of a general shortage of nurses in Massachusetts, employment prospects will continue to be good for LPNs in the hospital sector.

A faster than average growth is expected for LPNs due to the rising demand in nursing homes, personal care facilities, home health programs and other settings providing long-term care. There will be very good job prospects for new graduates and experienced nurses alike.

## RELATED OCCUPATIONS

Emergency Medical Technicians
Social Service Aides

## INSTITUTIONS PROVIDING TRAINING IN MASSACHUSETTS

Two-Year (Associate's) Degree:

Berkshire Community College
West Street
Pittsfield, MA 01201
413/499-4660

Essex Agricultural and Technical
Institute/Collegiate Division
Route 62
Danvers, MA 01923
508/774-0050

Massachusetts Bay Community College
50 Oakland Street
Wellesley Hills, MA 02181
617/237-1100

Northern Essex Community College
100 Elliott Street
Haverhill, MA 01830
508/374-3907

Quincy Junior College
34 Coddington Street
Quincy, MA 02169
617/786-8799

## WHERE TO WRITE FOR MORE INFORMATION

Communications Department
National League for Nursing
10 Columbus Circle
New York, NY 10019

National Association for Practical Nurse Education and Service, Inc.
10801 Pear Tree Lane, Suite 151
St. Louis, MO 63074

National Federation of Licensed Practical Nurses, Inc.
PO Box 11038
Durham, NC 27703

Recruitment and Placement Service
Veterans Administration
810 Vermont Avenue, NW
Washington, DC 20420

American Hospital Association
Division of Nursing
840 North Lake Shore Drive
Chicago, IL 60611

American Health Care Association
1200 15th Street, NW
Washington, DC 20005

## MEDICAL ASSISTANTS

Medical assistants, sometimes called clinical practice assistants, provide support services in doctors' offices and clinics. They help physicians treat patients, and they perform clerical and administrative work. Some medical assistants specialize in either clinical or clerical duties; in small offices, these assistants usually do both kinds of work. Their responsibilities can include taking patients' pulse and blood pressure, helping the physician during examinations and procedures, and sterilizing instruments, as well as scheduling appointments, arranging for lab tests, and handling medical records and insurance forms.

## EDUCATION, TRAINING AND HIRING REQUIREMENTS

Medical assistants do not have to be licensed. Some employers offer on-the-job training programs, usually lasting about two weeks. There are also formal training programs, in high schools and junior colleges, which grant certificates or associate's degrees. Employers prefer medical assistants to have high school degrees. If an applicant has health care experience, however, this requirement may be waived. Some medical assistants in the Boston area have bachelor's degrees but no other work experience and are using the occupation as a way to enter the health care field.

The curricula of accredited programs include anatomy and physiology; medical terminology; medical law and ethics; psychology; communications; medical assisting administrative procedures; and medical assisting clinical procedures (including medical office emergency situations; pharmaceutical principles and medication administration; patient preparation, specimen collection, and basic office diagnostic procedures). Programs include an externship that provides practical experience in qualified physicians' offices, accredited hospitals or other health care facilities.

In clinic and hospital settings, medical assistants have to take direction from two sets of people - the physicians with whom they work closely and an administrative supervisor with whom they have less contact. Medical assistants can move into more responsible administrative jobs on the basis of experience and skills alone; however, advancement into related clinical occupations requires further schooling. On a clinical career path, medical assistants may want to advance to a licensed practical nurse or lab technician position, both of which require at least an additional year of education.

## INDUSTRIES THAT EMPLOY MEDICAL ASSISTANTS

| SIC | Industry | Percentage of Occupation |
|---|---|---|
| 801 | Offices & Clinics of Medical Doctors | 51.3% |
| 902 | State Government | 21.2 |
| 806 | Hospitals | 16.6 |
| 804 | Offices of Other Health Practitioners | 4.0 |
| 808 | Home Health Care Services | 3.3 |
| 903 | Local Government | 2.6 |

## OCCUPATIONAL EARNINGS

Depending on experience, average wages of medical assistants range from $6.00 to $8.50 an hour.

## EMPLOYMENT OUTLOOK

Employment of medical assistants is expected to grow much faster than average due to the anticipated expansion of the health services industry. Employment growth will be spurred by the increased medical needs of an aging population, growth in the number of practitioners, more diagnostic testing and the increased volume and complexity of paperwork. Job prospects will be greatest for those with formal training. However, because the need will be so great, employers will train applicants provided they exhibit the necessary personal traits.

## RELATED OCCUPATIONS

Podiatric Assistants
Medical Records Technicians

## INSTITUTIONS PROVIDING TRAINING IN MASSACHUSETTS

Two-Year (Associate's) Degree:

Aquinas Junior College - Milton
303 Adams Street
Milton, MA 02186
617/696-3100

Aquinas Junior College - Newton
15 Walnut Park
Newton, MA 02158
617/969-4400

Bay Path Junior College
588 Longmeadow Street
Longmeadow, MA 01106
413/567-0621

Becker Junior College-Leicester
3 Paxton Street
Leicester, MA 01524
508/892-8122

Dean Junior College
99 Main Street
Franklin, MA 02038
508/528-9100

Endicott College
376 Hale Street
Beverly, MA 01915
508/927-0585

Massasoit Community College
The Technical Institute at Blue Hills
100 Randolph Street
Canton, MA 02021
617/838-5800

Middlesex Community College
Springs Road
Bedford, MA 01730
617/275-8910

Mount Ida College
777 Dedham Street
Newton Centre, MA 02159
617/969-7000

Newbury College
129 Fisher Avenue
Brookline, MA 02146
617/739-7822

Springfield Technical Community College
One Armory Square
Springfield, MA 01105
413/781-7822

**WHERE TO WRITE FOR MORE INFORMATION**

The American Association of Medical Assistants
20 North Wacker Drive
Suite 1575
Chicago, ILL 60606

American Medical Technologists
Registered Medical Assistants
710 Higgins Road
Park Ridge, ILL 60068

Accrediting Bureau of Health Education Schools
Oak Manor Office
29089 U.S. 20 West
Elkhart, IN 46514

Joint Commission of Allied Health Personnel in Ophthalmology
1812 N. St. Paul Road
St. Paul, MN 55109

## MEDICAL LABORATORY TECHNICIANS AND TECHNOLOGISTS

Medical laboratory personnel perform tests on blood, tissue and bodily fluids to diagnose illness. Duties of lab workers may include examining of blood and tissue under a microscope, growing cultures of tissue or fluid to determine the presence of bacteria, and matching blood types for transfusions. Laboratory technologists, who often hold supervisory positions in a lab, have more education and experience and perform more complex tests and analyses than do technicians. (Medical laboratory technicians are sometimes called clinical laboratory technicians.) Another important laboratory job is that of phlebotomist - the person who draws blood.

In large labs, and in hospitals that have several different labs, technologists and technicians tend to specialize in a particular field. Common areas of specialization include biochemistry (chemical analysis of body fluids), microbiology (the study of bacteria and other microorganisms), hematology (the study of blood cells), histology (the study of human tissue), cytotechnology (the study of cells) and blood bank technology (typing and matching blood for transfusions).

## EDUCATION, TRAINING AND HIRING REQUIREMENTS

Lab technicians and technologists do not have to be licensed to practice, but many boards and organizations certify technologists in different specialties. Certification, though voluntary, helps in career advancement. Most technologists have a bachelor's degree in one of the life sciences; those who do highly specialized research often possess a graduate degree. Courses include chemistry, biological sciences, organic and/or biochemistry, microbiology, immunology and mathematics. Technicians are usually required to have an associate's degree or to have graduated from some other technical training program. Phlebotomists are generally trained on the job.

Technicians can advance to the position of technologists with additional education or sometimes with experience alone. Technologists can move into supervisory positions or research work; some go to work for manufacturers of laboratory equipment.

## INDUSTRIES THAT EMPLOY MEDICAL LABORATORY TECHNICIANS AND TECHNOLOGISTS

| SIC | Industry | Percentage of Occupation |
|---|---|---|
| 806 | Hospitals | 61.7% |
| 807 | Medical and Dental Laboratories | 23.7 |
| 801 | Offices of Physicians | 8.9 |
| 808 | Outpatient Care Facilities | 3.4 |
| 809 | Health and Allied Services | 1.9 |

## OCCUPATIONAL EARNINGS

Technologists who are just out of school earn salaries ranging from $18,000 to $24,000. Experienced medical technologists, or those in supervisory positions, earn between $21,000 and $28,000. Technicians earn between $16,500 and $21,000. Phlebotomists' salaries are in the range of $13,000 to $17,500.

## EMPLOYMENT OUTLOOK

Jobs for lab workers are expected to grow somewhat more slowly than other health occupations over the next ten years. Employment of medical laboratory technicians compared to all occupations is expected to experience only average growth even though there will be an increased volume of testing due to advances in laboratory automation which will boost production. Three fundamental reasons for increased volume of testing are: the increase in disease and disability that will accompany rapid growth of the middle-aged and older population; the probability of new, more powerful diagnostic tests; and lastly, continued demand from research laboratories that work to find the cause, treatment and cure for diseases. However, the number of patient days in hospitals is decreasing, and pressure to contain costs is resulting in fewer lab tests while hospitalized.

Many job opportunities will be in hospitals, but new opportunities will arise in commercial laboratories, health maintenance organizations and doctors' offices.

## RELATED OCCUPATIONS

Medical Technologists
Microbiology Technologists
Chemistry Technologists
Cytotechnologists
Tissue Technologists

## INSTITUTIONS PROVIDING TRAINING IN MASSACHUSETTS

Four-Year (Bachelor's) Degree:

American International College
1000 State Street
Springfield, MA 01109
413/737-7000

Anna Maria College
Sunset Lane
Paxton, MA 01612
508/757-4586

Assumption College
500 Salisbury Street
Worcester, MA 01609
508/752-5615

Elms College
291 Springfield Street
Chicopee, MA 01013
413/598-8351

Emmanuel College
400 The Fenway
Boston, MA 02115
617/277-9340

Fitchburg State College
160 Pearl Street
Fitchburg, MA 01420
508/345-2151

Framingham State College
120 State Street
Framingham, MA 01701
508/620-1220

Merrimack College
Turnpike Street
North Andover, MA 01845
508/683-7111

North Adams State College
Church Street
North Adams, MA 01247
413/664-4511

Northeastern University
360 Huntington Avenue
Boston, MA 02115
617/437-2200

Regis College
235 Wellesley Street
Weston, MA 02193
617/893-1820

Salem State College
352 Lafayette Street
Salem, MA 01970
508/745-0556

Simmons College
300 The Fenway
Boston, MA 02115
617/738-2107

Southeastern Massachusetts
University
Old Westport Road
North Dartmouth, MA 02747
508/999-8605

Springfield College
263 Alden Street
Springfield, MA 01109
413/788-3136

Stonehill College
Washington Street
North Easton, MA 02356
508/238-1081

Suffolk University
Beacon Hill
Boston, MA 02108
617/723-4700

University of Lowell
One University Avenue
Lowell, MA 01854
508/452-5000

UMass/Amherst
255 Whitmore
Amherst, MA 01003
413/545-0222

UMass/Boston
Harbor Campus
Boston, MA 02125
617/929-7102

Two-Year (Associate's) Degree:

Bristol Community College
777 Elsbree Street
Fall River, MA 02720
508/678-2811

Mass. Bay Community College
50 Oakland Street
Wellesley Hills, MA 02181
617/237-1100

Massasoit Community College
900 Randolph Street
Canton, MA 02021-1399
617/821-2222

Middlesex Community College
Springs Road
Bedford, MA 01730
617/275-8910

Mt. Wachusett Community College
444 Green Street
Gardner, MA 01440
508/632-6600

Springfield Tech. Community College
One Armory Square
Springfield, MA 01105-1204
413/781-7822

Certificates:

Baystate Medical Center
759 Chestnut Street
Springfield, MA 01199
413/784-4520

Berkshire Medical Center
759 Chestnut Street
Springfield, MA 01199
413/447-2580

Cambridge Hospital
1493 Cambridge Street
Cambridge, MA 02139
617/498-1228

Lawrence General Hospital
1 General Street
Lawrence, MA 01842
617/683-4000

Mercy Hospital
271 Carew Street
Springfield, MA 01102-9012
413/781-9100

Newton-Wellesley Hospital
2014 Washington Street
Newton Lower Falls, MA 02162
617/243-6140

Southeastern Regional Voc-Tech
250 Foundry Street
South Easton, MA 02375
508/238-4374

Veterans Administration Medical Ctr.
150 South Huntington Avenue
Boston, MA 02130
617/739-3471

**WHERE TO WRITE FOR MORE INFORMATION**

American Society for Medical Technology
2021 L St. NW - Ste. 400
Washington, DC 20036

American Society of Clinical Pathologists
2100 W. Harrison Street
Chicago, Il 60612

National Society for Histotechnology
5900 Princess Garden Parkway- Ste. 805
Lanham, MD 20706

## MEDICAL RECORDS TECHNICIANS

Medical records technicians are responsible for maintaining and organizing patients' medical records. Using standard codes and classification systems, these technicians record symptoms, diagnoses, procedures and medications. They also retrieve the data for doctors, insurance companies, hospital administrators and public health offices. For research purposes, medical records technicians may need to retrieve and organize data in particular ways, sorted by occurrence of symptoms or diagnosis, for example. As medical records departments are generally automated, technicians spend a great deal of time working with computers, both entering and retrieving data.

In the medical records departments of large hospitals and health maintenance organizations (HMOs), there is a tremendous amount of clerical work such as transcribing, data entry and filing, as well as the more technical medical records work. In these settings, certified medical records technicians may specialize in the technical work, such as translating physicians' notes into codes or maintaining tumor registries; or they may work in supervisory positions, coordinating the work of data entry clerks and release-of-information clerks who fill out forms for schools, camps or insurance companies and obtain physicians' signatures.

## EDUCATION, TRAINING AND HIRING REQUIREMENTS

Most technicians hold an associate's degree from an accredited medical records program. Educational courses include medical terminology, anatomy and physiology, medical record science, machine transcription, statistics, and coding and indexing. It is possible, however, to start as a clerk in a medical records department and advance after several years to the position of technician through on-the-job training and study in a correspondence program. Technicians can advance to administrative positions with more responsibility for planning and developing information systems and supervising other medical records staff.

Medical records technicians can become certified through passing an examination. Certification is not necessary to practice; however, many employers prefer it and some require it, especially for supervisory positions.

## INDUSTRIES THAT EMPLOY MEDICAL RECORDS TECHNICIANS

| SIC | Industry | Percentage of Occupation |
|---|---|---|
| 806 | Hospitals | 67.1% |
| 805 | Nursing and Personal Care Facilities | 12.7 |
| 808 | Home Health Care Services | 7.6 |

## OCCUPATIONAL EARNINGS

Certified medical records technicians earn between $17,000 and $22,000. Clerks who are responsible for releasing information earn between $12,500

and $17,000. Data entry clerks in medical records departments typically earn between $11,500 and $15,000.

## EMPLOYMENT OUTLOOK

Job opportunities for medical records technicians are expected to be very good. Employment of medical records technicians is expected to grow much faster than average because of the pivotal role of medical records in managing health care costs. Management needs for accurate clinical data for purposes of financial control is the overriding reason for anticipated job growth. New reimbursement systems and other pressures to control costs are making medical records departments a more and more important part of health care management.

Most job openings will be in hospitals due to the greatly increased need by management for complete, accurate and timely clinical data. However, the need for accurate and up-to-date medical records is not confined to hospitals. Health maintenance organizations, surgicenters, medical group practices, nursing homes and home health agencies share the need for complete and timely data.

The outlook for experienced technicians is excellent. Graduates of accredited programs will also be in great demand because the number completing programs is expected to fall short of demand.

## RELATED OCCUPATIONS

Information Clerks
Insurance Clerks
Medical Secretaries
Medical Transcriptionists

## INSTITUTIONS PROVIDING TRAINING IN MASSACHUSETTS

Two-Year (Associate's) Degree:

Endicott College
376 Hale Street
Beverly, MA 01915
508/927-0585

Holyoke Community College
303 Homestead Avenue
Holyoke, MA 01040
413/538-7000

Catherine Laboure College
2120 Dorchester Avenue
Boston, MA 02124
617/296-8300

Massachusetts Bay Community College
50 Oakland Street
Wellesley Hills, MA 02181
617/237-1100

Northern Essex Community College
100 Elliot Street
Haverhill, MA 01830
508/374-0721

Four-Year (Bachelor's) Degree:

Northeastern University
360 Huntington Avenue
Boston, MA 02115
617/437-2200

## WHERE TO WRITE FOR MORE INFORMATION

American Medical Records Association
Suite 1850
875 N. Michigan Avenue
Chicago, IL 60611

## MEDICAL SOCIAL WORKERS

Medical social workers are trained to help patients and their families cope with devastating illnesses and handle problems that may stand in the way of recovery or rehabilitation. Most medical social workers are employed by hospitals to handle patient counseling or pre-admissions and discharge planning. A substantial number also work in nursing homes, where they help with the admissions process and direct the activities program in addition to counseling residents and their families. Some have jobs with group medical practices, health maintenance organizations, rehabilitation centers and hospices. They also have considerable involvement in interdisciplinary consultation and interagency collaboration.

Counseling services for individuals suffering from a terminal illness or chronic illness differ from hospital to hospital. Generally, these services are the responsibility of the social work department. This traditional role has expanded as technology has extended the survivability of very ill people by months or even years. The medical social workers assist the patients to confront shortened life expectancy, multiple hospitalizations and surgeries, extremely demanding treatment regimes, extended rehabilitation periods and various lifestyle changes. In addition, hospital social workers assist family caregivers by organizing support groups for families of patients suffering from cancer, Alzheimer's disease, end-stage renal disease, or other illnesses that impose a heavy burden on families.

Discharge planning, an important part of the hospital social workers' job, has come about because hospitals are under financial pressure to release patients as rapidly as possible. Temporary living arrangements must be planned for out-of-town patients discharged from day surgery. Provision for continuing care at rehabilitation and recuperative centers must be arranged for immobile patients. Discharge planners arrange for the various services - from meals-on-wheels to home health aides - that make it possible to send patients home as soon as their medical conditions allow.

## EDUCATION, TRAINING AND HIRING REQUIREMENTS

In January 1986, a new law went into effect in Massachusetts requiring anyone using the title of Social Worker (except those employed by state and local government) to pass a licensing examination. The new law provides for four levels of licensure with different titles and qualifications for each level. A Licensed Social Worker (LSW) holds either a bachelor's degree in social work or a bachelor's degree in a related field plus two years of experience. Medical social workers must have a bachelor's degree from an accredited college or university. Social workers providing direct clinical services utilizing individual, group and family treatment modalities generally are required to have a master's in social work. In Massachusetts, Licensed Certified Social Workers (LCSW) and Licensed Independent Clinical Social Workers (LICSW) must possess a master's or doctorate degree in social work from an accredited education institution. Two years of specialized study, including 900 hours of supervised field instruction, or internship, are required to earn a master's degree in social work. Previous training in social work is not required for entry into a graduate program, but courses such as psychology, sociology, economics, political science, history, social anthropology and urban studies, as well as social work, are recommended.

## INDUSTRIES THAT EMPLOY MEDICAL SOCIAL WORKERS

| SIC | Industry | Percentage of Occupation |
|---|---|---|
| 830 | Social Services | 37.0% |
| 806 | Hospitals | 23.4 |
| 808 | Outpatient Care Facilities | 16.4 |
| 805 | Nursing and Personal Care Facilities | 5.0 |
| 809 | Health & Allied Services, NEC | 3.5 |
| 801 | Offices & Clinics of Medical Doctors | 3.2 |

## OCCUPATIONAL EARNINGS

The typical salary range for medical social workers in Massachusetts is $24,000 to $37,000. The average annual entry level wage for medical social workers in Massachusetts ranges from $23,000 to $31,000. The highest salary paid experienced workers in Massachusetts is around $44,000.

## EMPLOYMENT OUTLOOK

Employment of medical social workers is expected to increase faster than the average for all occupations in response to the needs of an expanding and aging population. Prospects for hospital social workers should be favorable. Financing and organizational changes have affected hiring practices in health services. Because of the unprecedented emphasis in discharge planning, the hospital social worker's knowledge of community resources has taken a new importance. The pivotal role of discharge planning in facilitating early discharge is expected to sustain demand for hospital social workers despite projected slow growth in the hospital industry as a whole. Demand for social workers is expected to grow in outpatient facilities, including health maintenance organizations (HMOs) and rehabilitation facilities that offer alcohol and drug abuse programs. Financing is not an obstacle, as a rule; HMOs provide comprehensive care or a pre-established fee, and alcohol or drug rehabilitation programs often are covered by employers or by health insurance, although some patients pay their own costs.

## RELATED OCCUPATIONS

Clergy
Counselors
Counseling Psychologists
Psychiatric Social Workers
Vocational Rehabilitation Counselors

## INSTITUTIONS PROVIDING TRAINING IN MASSACHUSETTS

### Graduate Degree

Boston College
140 Commonwealth Avenue
Chestnut Hill, MA 02167
617/552-8000

Boston University
121 Bay State Road
Boston, MA 02215
617/353-2000

Salem State College
352 Lafayette Street
Salem, MA 01970
508/745-0556

Simmons College
300 The Fenway
Boston, MA 02115
617/738-2000

Smith College
Elm Street
Northampton, MA 01063
413/585-2700

### Four Year (Bachelor's) Degree

Anna Maria College
Sunset Lane
Paxton, MA 01612-1198
508/757-4586

Atlantic Union College
Main Street
South Lancaster, MA 01561
508/365-4561

Bridgewater State College
Tillinghast Hall
Bridgewater, MA 02324
508/697-1237

Wheelock College
200 The Riverway
Boston, MA 02215
617/734-5200

College of Our Lady of the Elms
291 Springfield Street
Chicopee, MA 01013-2839
413/594-2761

Eastern Nazarene College
23 East Elm Avenue
Quincy, MA 02170
617/773-6350

Regis College
235 Wellesley Street
Weston, MA 02193
617/893-1820

Salem State College
352 Lafayette Street
Salem, MA 01970
508/745-0556

Smith College
Elm Street
Northampton, MA 01063
413/585-2700

Western New England College
1215 Wilbraham Road
Springfield, MA 01119
413/782-3111

## WHERE TO WRITE FOR MORE INFORMATION

National Association of Social Workers
7981 Eastern Avenue
Silver Spring, MD 20910

Council on Social Work Education
1744 R Street, NW
Washington, DC 20009

## NUCLEAR MEDICAL TECHNOLOGISTS

Nuclear medicine is a specialty within the field of radiologic technology, which has grown as advances in computer technology have made a broader range of radiologic treatments and diagnostic procedures possible. Nuclear medical technologists administer radiopharmaceuticals, or radioactive substances, to patients, then measure and record the gamma rays emitted by the radiopharmaceuticals from different organs and tissues in the body. These technologists prepare samples taken from patients and images of different parts of their bodies (viewed on a screen or film). The information is then used by physicians to diagnose conditions such as cancer, blood clots, stroke or other metabolic problems. Technologists may also give radiopharmaceuticals in larger dosages in order to treat patients.

These tasks require nuclear medical technologists to work with special imaging equipment and to prepare and maintain detailed records of all radiopharmaceuticals used and of each patient treated. They must protect themselves, co-workers and patients by following radiation safety procedures. Some technologists do research or handle administrative functions. In addition, they often have to provide nursing care to the patients undergoing diagnosis or treatment, many of whom are seriously ill.

## EDUCATION, TRAINING AND HIRING REQUIREMENTS

A number of formal training programs in nuclear medicine technology are offered at community, state and private colleges in Massachusetts. Educational courses include nuclear physics, instrumentation and statistics, biochemistry, immunology, radio pharmacology, radiation biology, clinical nuclear medicine, radionuclide therapy, and introduction to computer applications. The programs lead to either an associate's or bachelor's degree. A license is not required for this occupation in Massachusetts, but trained technologists who pass a written exam can receive professional credentials through the American Registry of Radiologic Technologists and the Nuclear Medicine Technology Certification Board.

## INDUSTRIES THAT EMPLOY NUCLEAR MEDICAL TECHNOLOGISTS

| SIC | Industry | Percentage of Occupation |
|---|---|---|
| 806 | Hospitals | 100.0% |

## OCCUPATIONAL EARNINGS

Salaries range between $20,000 and $28,000, with slightly higher wages for technologists that are certified.

## EMPLOYMENT OUTLOOK

Slower than average growth in Massachusetts is projected for this occupation - approximately a 7 percent increase through the year 2000. The nuclear medicine field is likely to develop as equipment and diagnostic capabilities are improved, particularly because radiopharmaceuticals are used for early detection of cancer. Shifts in hospital staffing patterns, however, will also affect this specialty occupation. Hospitals will continue to reduce the number of tests per patient in order to reduce costs; some may also "cross train" staff so that fewer jobs in each specialty area of radiologic technology will be available.

Employment growth is likely to be constrained by competition from less invasive imaging methods - computed tomography (CT) and magnetic resonance imaging in particular. Developments in diagnostic imaging technology are occurring at a dramatic pace, and it is likely that some of the tests that emerge by the year 2000 will replace procedures currently performed by nuclear medicine technologists.

## RELATED OCCUPATIONS

Radiologic Technicians
X-Ray Technologists

## INSTITUTIONS PROVIDING TRAINING IN MASSACHUSETTS

Two-Year (Associate's) Degree:

Bunker Hill Community College
New Rutherford Avenue
Charlestown, MA 02129
617/241-8600

Massachusetts College of Pharmacy
and Allied Health Sciences
179 Longwood Avenue
Boston, MA 02115
617/732-2800

Springfield Technical Community College
One Armory Square
Springfield, MA 01105
413/781-7822

UMass Medical Center/Worcester State College
55 Lake Avenue, North
Worcester, MA 06655
508/856-4254

Four-Year (Bachelor's) Degree:

Anna Maria College
Sunset Lane
Paxton, MA 01612
617/757-4586

Salem State College
352 Lafayette Street
Salem, MA 01970
617/745-0556

## WHERE TO WRITE FOR MORE INFORMATION

American Society of Radiologic Technologists
1500 Central Avenue, SE
Albuquerque, NM 87123

Society of Nuclear Medicine
136 Madison Avenue
New York, NY 10016

Society of Diagnostic Medical Sonographers
10300 N. Central Expressway
Building 1, Suite 276
Dallas, TX 75231

Vice President for Professional Education
American Cancer Society
90 Park Avenue
New York, NY 10016

Division of Allied Health Education and Accreditation
American Medical Association
535 N. Dearborn Street
Chicago, IL 60610

Joint Review Committee on Education Programs in Nuclear Medicine Tech.
445 South, 300 East Street
Salt Lake City, UT 84111

## NURSING AIDES AND PSYCHIATRIC AIDES

Nursing aides in general hospitals work under the supervision of registered nurses and licensed practical nurses. They feed, bathe and dress patients; make beds; serve meals; and answer patients' bell calls. Aides take temperatures, assist patients in getting out of bed and walking, and provide and empty bed pans. At times, nursing aides may escort patients to operating, examining and treatment rooms.

Aides employed in nursing homes or recuperative centers also work under the general supervision of registered nurses and licensed practical nurses. However, they are often the principal caregivers and may have more contact with patients than other staff members. They help residents in and out of bed, bathe, dress and feed. They also may take and record vital signs and massage immobile or comatose patients. Because many nursing home residents have extended stays, aides are expected to develop ongoing relationships with them and so contribute directly to the emotional support as well as the physical care of patients.

### Psychiatric Aides

Psychiatric aides, known also as mental health assistants, care for people who are mentally impaired or emotionally troubled. They work in state and county mental hospitals, private psychiatric hospitals, psychiatric units of general hospitals, community mental health centers, health maintenance organizations, group residences for the mentally retarded, halfway houses, and drug abuse and alcoholism treatment facilities. They work as part of a treatment team observing patient behavior and reporting any meaningful signs or actions to the professional staff. Aides interview and counsel patients and their families, and participate in daily recreation, work and treatment programs. They socialize with patients by playing cards or other games, by participating in sports and other organized activities and by walking and chatting with patients. By being emotionally supportive and comforting, they influence the patients' treatment and implement the treatment plan. If necessary, they may restrain and seclude suicidal and destructive patients.

## EDUCATION, TRAINING AND HIRING REQUIREMENTS

Formal training for nursing and psychiatric aides is not required and sometimes neither a high school diploma nor previous work experience is necessary. Nevertheless, nearly all employers prefer to hire aides who have some training or experience. Hospitals, for example, may require a minimum of one year's experience as a nursing aide or a home health aide. Nursing homes and recuperative centers, however, generally are willing to hire untrained and inexperienced workers with the understanding that the aide will complete the necessary training within the first few weeks or months on the job.

The typical nursing aide training program is offered in a vocational-technical institute, community college, or nursing home. It covers body mechanics, nutrition, anatomy and physiology, infection control, communications skills and patient care techniques. Orientation programs for

newly hired aides are customary in both hospitals and nursing homes, but these vary in length and sophistication. Some facilities provide classroom instruction while others rely exclusively on informal instruction from a licensed nurse or an experienced aide.

Newly hired aides learn to take and record vital signs, bathe patients, change linens on beds occupied by patients and lift and move patients. In nursing homes, aides are also taught to help residents with daily living activities and to deal with confused or disruptive residents. Additionally, psychiatric aides are taught interpersonal relations, group dynamics, socialization techniques and ways to improve their communications skills.

## INDUSTRIES THAT EMPLOY NURSING AIDES AND PSYCHIATRIC AIDES

| SIC | Industry | Percentage of Occupation |
|---|---|---|
| 805 | Nursing & Personal Care Facilities | 54.0% |
| 806 | Hospitals | 35.0 |
| 821 | Elementary & Secondary Schools | 6.0 |
| 836 | Residential Care | 3.0 |
| | **Nursing Aides - United States** | |
| 805 | Nursing & Personal Care Facilities | 44.0% |
| 806 | Hospitals | 31.0 |
| | **Psychiatric Aides - United States** | |
| 805 | Hospitals | 92.0% |
| 806 | Nursing & Personal Care Facilities | 3.0 |

## OCCUPATIONAL EARNINGS

Nursing aides generally earn from $4.50 to $5.97 an hour. Nationally, the median annual salaries of nursing aides employed in hospitals is higher than those employed in nursing homes.

## EMPLOYMENT OUTLOOK

### Nursing Aides

Employment of nursing aides is expected to grow faster than the average for all occupations in response to the long-term care needs of a growing and aging population and of individuals with chronic disabling conditions. Employment of nursing aides in hospitals is expected to decline due to shifts in staffing patterns as hospitals concentrate on providing intensive, high-technology care to seriously ill patients. Patients who are not quite so ill, and those in need of continued care after a hospital stay, will be treated elsewhere - in a rehabilitation unit, a nursing home, or at home. For this reason, long-term care settings - not hospitals - are expected to provide most of the new jobs for nursing aides in the years ahead.

Psychiatric Aides

Nationally, employment of psychiatric aides is expected to grow more slowly than the average for all occupations. In Massachusetts, employment of psychiatric aides is expected to decline. Due to constraints on public spending and continued support for a policy of deinstitutionalization, employment of psychiatric aides in public mental health hospitals is not likely to grow much. Demand for in-patient care in private, psychiatric facilities is likely to expand for several reasons. Among them are broad third-party coverage for acute psychiatric incidents, growing public acceptance of formal treatment for drug abuse and alcoholism; and lessening of the stigma attached to receiving mental health care.

While most openings for psychiatric aides are likely to occur in private hospitals, additional opportunities will be available in such settings as community mental health centers, residential treatment facilities, halfway houses, and outpatient psychiatric clinics. Replacement needs will constitute the major source of openings.

**RELATED OCCUPATIONS**

Nursing Aides

Homemaker-Home Health Aides
Childcare Attendants
Companions
Occupational Therapy Aides
Physical Therapy Aides

Psychiatric Aides

Psychologists
Psychiatrists
Registered Nurses
Clinical Social Workers
Human Service Workers
Rehabilitation Counselors
Occupational Therapists
Recreational Therapists

**INSTITUTIONS PROVIDING TRAINING IN MASSACHUSETTS**

Nursing Aides

Certificate Programs:

Diman Regional Technical High School
Stonehaven Road
Fall River, MA 02723
508/678-2891

Essex Agricultual & Technical Institute
562 Maple St.
Danvers, MA 01923

## Psychiatric Aides

### Certificate Programs

Bunker Hill Community College
New Rutherford Avenue
Charlestown, MA 02129
617/262-3240

North Shore Community College
3 Essex Street
Beverly, MA 01915
508/922-6722

Northern Essex Community College
Elliot Way
Haverhill, MA 01830
508/374-3900

### Associate Degree Programs

Bunker Hill Community College
New Rutherford Avenue
Boston, MA 02129
617/241-8600

Middlesex Community College
Springs Road
Bedford, MA 01730
617/275-8910

Mount Wachusett Community College
444 Green Street
Gardner, MA 01440
508/632-6600

Northern Essex Community College
Elliot Way
Haverhill, MA 01440
08/632-6600

North Shore Community College
3 Essex Street
Beverly, MA 01915
508/922-6722

## Social or Human Services

### Certificate Programs

North Shore Community College
3 Essex Street
Beverly, MA 01915
508/922-6722

### Associate Degree Programs

Becker Junior College
61 Seaver Street
Worcester, MA 01609
508/791-9241

Berkshire Community College
West Street
Pittsfield, MA 01201
413/499-4660

Bristol Community College
777 Elsbree Street
Fall River, MA 02720
508/791-9241

Dean Junior College
99 Main Street
Franklin, MA 02038
508/528-9100

Holyoke Community College
303 Homestead Avenue
Holyoke, MA 01040
413/538-7000

Lasell Junior College
1844 Commonwealth Avenue
Newton, MA 02166
617/243-2225

Massasoit Community College
1 Massasoit Blvd.
Brockton, MA 02402
508/588-9100

Merrimack College
300 Turnpike Street
North Andover, MA 01845
508/683-7111

Mount Ida - Chamberlayne College
777 Dedham Street
Newton, MA 02159
617/969-7000

North Shore Community College
3 Essex Street
Beverly, MA 01915
508/922-6722

Springfield Technical Community College
One Armory Square
Springfield, MA 01101
413/781-7822

Suffolk University
8 Ashburton Place
Boston, MA 02108
617/723-4700

**WHERE TO WRITE FOR MORE INFORMATION**

American Hospital Association
Division of Nursing
840 North Lake Shore Drive
Chicago, IL 60611

American Health Care Association
1200 15th St., NW
Washington, DC 20005

The National Mental Health Association
1021 Prince Street
Alexandria, VA 22314

## OCCUPATIONAL THERAPISTS

The term "occupational therapy" is somewhat misleading - it is not only related to occupation, or work. Occupational therapists help patients develop or regain their ability to engage in purposeful activity, such as dressing and grooming themselves, cooking and housecleaning, going to school and learning, interacting with others, and - in some cases - working. Patients in occupational therapy may be of any age and may have physical, emotional or developmental disabilities or injuries.

Occupational therapists analyze the kinds of activities that their patients need to perform to resume or maintain a normal life and then plan therapy accordingly. Often therapists practice activities with a patient; sometimes therapists must figure out ways to modify activities so they are easier for disabled persons to master. Occupational therapists also devise physical aids such as braces and splints and help patients learn to use them.

Occupational therapists usually work as part of a team that can include a doctor, nurse, psychologist and physical therapist. About 60 to 70 percent of most occupational therapists' days are spent in direct care with either individuals or groups; the remainder is spent in meetings, evaluations and documentation. Most occupational therapists specialize in working with a particular kind of disability. A little more than half of all occupational therapists work with patients who have primarily physical disabilities, and the rest work with those who have psychological or developmental problems.

## EDUCATION, TRAINING AND HIRING REQUIREMENTS

Occupational therapists must be licensed to practice in Massachusetts. To obtain a license, applicants must graduate from an accredited program and pass an examination. Training to be an occupational therapist involves at least a bachelor's degree. Bachelor's degree programs generally last five years, the last year being an affiliation or internship in a clinical setting. Entry into these programs is quite competitive, and candidates should have good grades in science and health courses. There are also a number of master's degree programs in occupational therapy. Occupational therapists interested in becoming specialists in particular areas or in entering administrative, research or teaching positions often undertake graduate training.

## INDUSTRIES THAT EMPLOY OCCUPATIONAL THERAPISTS

| SIC | Industry | Percentage of Occupation |
|---|---|---|
| 806 | Hospitals | 58.8% |
| 805 | Nursing and Personal Care Facilities | 12.5 |
| 830 | Social Services | 11.5 |
| 808 | Outpatient Care Facilities | 5.2 |
| 809 | Health and Allied Services, NEC | 4.9 |

## OCCUPATIONAL EARNINGS

Earnings for occupational therapists range between $19,000 and $25,000. Therapists who are very experienced, who have master's degrees, or who are in supervisory positions can earn up to $35,000 or more.

## EMPLOYMENT OUTLOOK

Job opportunities for occupational therapists are expected to be excellent due to growing demand for mental health, rehabilitative and elder care. The number of people who need rehabilitative services will rise as advances in medical technology continue to save lives that would have been lost. Additionally, as the baby boom generation begins to move into middle age, a period of high risk of heart disease, demand for cardiac rehabilitation programs is expected to increase markedly. Finally, substantial growth is projected for the population of 85 years of age and above, an age group that suffers a very high incidence of disabling conditions.

Excellent job opportunities are expected in hospitals, nursing homes, school systems, schools for handicapped children, community mental health centers, home health programs and private practice. The demand is expected to outstrip the supply for occupational therapists.

## RELATED OCCUPATIONS

Industrial Therapists
Occupational Therapy Aide or Assistants

## INSTITUTIONS PROVIDING TRAINING IN MASSACHUSETTS

Two-Year (Associate's) Degree:

Becker Junior College - Leicester
3 Paxton Street
Leicester, MA 01524
508/892-8122

Quinsigamond Community College
670 West Boylston Street
Worcester, MA 01606
508/853-2300

North Shore Community College
3 Essex Street
Beverly, MA 01915
508/927-4850

Four-Year (Bachelor's) Degree:

Boston University
121 Bay State Road
Boston, MA 02215
617/353-2300

Tufts University
Medford, MA 02155
617/381-3170

Worcester State College
486 Chandler Street
Worcester, MA 01602
508/793-8040

**WHERE TO WRITE FOR MORE INFORMATION**

American Occupational Therapy Association
1383 Piccard Drive
Rockville, MA 20850

## OPHTHALMIC MEDICAL TECHNICIANS/TECHNOLOGISTS AND OPTOMETRIC ASSISTANTS/TECHNICIANS

Ophthalmic medical technicians/technologists assist the ophthalmologist with such tasks as taking medical histories, testing patients' eyes, administering ophthalmic medications, taking ocular measurements, testing ocular functions, fitting contact lenses, teaching eye exercises and assisting in eye surgery. Ophthalmic medical technologists perform all duties performed by technicians but are expected to do so at a higher level of expertise and to exercise considerable clinical judgement.

Optometric assistants/technicians assist the optometrist by keeping patients' records, helping patients select eyeglass frames, instructing in the care of contact lenses, ordering supplies and caring for instruments. They may fit eyeglasses to patients and make minor repairs to glasses. Technicians, more highly skilled than assistants, may measure corneas, test eyes, take eye pressure readings, and place eyedrops and ointment into patients' eyes. These workers are sometimes called paraoptometrics.

## EDUCATION, TRAINING AND HIRING REQUIREMENTS

Training programs for ophthalmic medical technicians/technologists are generally one to two years in length. Instruction should follow a planned outline which includes courses in anatomy and physiology, medical terminology, psychology, ocular anatomy and physiology, ophthalmic optics, microbiology, ophthalmic pharmacology and toxicology, ocular motility and diseases of the eye. The curriculum also includes diagnostic and treatment procedures, including visual field testing, fitting of contact lenses, and use of ophthalmic instruments and equipment. Students may also have a supervised clinical experience.

Training programs for optometric assistants/technicians generally are one or two years in length. Optometric assistant training combines classroom instruction and practice in optometric procedures. Course content includes preparing and fitting glasses and contact lenses, vision testing and maintenance of optometric instruments. Preparation for a career as an optometric technician includes enrollment in a 2-year college program leading to an associate degree. Courses of study include anatomy and physiology, ophthalmic optics, orthoptics, clinical practice/optics, contact-lens theory and practice, and office management.

## INDUSTRIES THAT EMPLOY OPHTHALMIC MEDICAL TECHNICIANS/TECHNOLOGISTS AND OPTOMETRIC ASSISTANTS/TECHNICIANS

| SIC | Industry | Percentage of Occupation |
|---|---|---|
| 804 | Offices of Other Health Practitioners | INA |
| 808 | Outpatient Care Facilities | INA |

## OCCUPATIONAL EARNINGS

According to a 1988 survey of program directors, salaries of entry level ophthalmic medical technologists, the highest paid of this group, averaged $23,571. Generally, earnings of these workers vary widely by geographic location and technical skills required.

## EMPLOYMENT OUTLOOK

Opportunities are expected to be good for graduates of formal training programs. The demand for services from optometrists and ophthalmologists will increase among baby boomers and the rapidly growing elderly population. The treatment of vision problems among the elderly, such as glaucoma, detached retinas, cataracts and macular degeneration will increase the need for corrective lenses and low-vision rehabilitation.

## RELATED OCCUPATIONS

Dispensing Opticians

## INSTITUTIONS PROVIDING TRAINING IN MASSACHUSETTS

Ophthalmic Medical Technicians/Technologists

Certificate Program, Associate Degree Program:

Boston University Medical Center
80 E. Concord Street - OPH.L907
Boston, MA 02281
617/424-4027

Optometric Technician

Associate Degree Program:

Newbury College, Inc.
921 Boylston Street
Boston, MA 02115
617/739-0510

## WHERE TO WRITE FOR MORE INFORMATION

Joint Commission of Allied Health Personnel in Ophthalmology
2025 Woodlane Drive
St. Paul, MN 55125-2995

American Optometric Association
Paraoptometric Section
243 North Lindbergh Blvd.
St. Louis, MO 63141

Association of Schools and Colleges of Optometry
6110 Executive Blvd.
Rockville, MD 20852

## PERFUSIONISTS

Perfusionists operate heart-lung machines (extracorporeal circulation equipment) to take over a patient's circulatory or respiratory functions during surgery or respiratory failure. Recent technical advances in blood recovery, tissue preservation, organ transplantation and artificial hearts have expanded the role played by the clinical perfusionist during major surgery. Perfusion (extracorporeal circulation) procedures involve specialized instrumentation and/or advanced life support techniques, and may include a variety of related functions. Perfusionists consult with the surgeon or physician to obtain patient information needed to set up the heart-lung machine. They also must work with the patient before surgery to obtain preliminary data. First, perfusionists determine the chemical profile of the patient's blood from a sample. The sample tells what physiological needs for oxygen and other chemicals the patient will require during surgery.

Before the surgery, perfusionists assemble, set up and test the heart-lung machine to ensure that the machine functions according to specifications. Available equipment must be adapted to suit the patient's needs. Next, perfusionists adjust and operate the bypass machine to regulate blood circulation and composition and oxygen and carbon dioxide levels. Perfusionists may administer blood products, anesthetic agents or drugs through the extracorporeal circuit on prescription. Perfusionists are responsible for controlling the body temperature of the patient during surgery or respiratory failure. At the direction of the physician, surgeon, or anesthesiologist, perfusionists change the quantities of drugs administered. Finally, they clean, repair and adjust malfunctioning parts of heart-lung machines.

## EDUCATION, TRAINING AND HIRING REQUIREMENTS

There are 20 accredited training programs in perfusion in the United States, two of which are in Massachusetts. Programs are generally one to two years in length, depending upon the program design, objectives, prerequisites, student qualifications and prior experience. A background in medical technology, respiratory therapy, or nursing is recommended for some programs, as is a background in the biological sciences. All of the programs require a minimum of a high school diploma (with high marks in biology and chemistry). Because of competition, most students currently entering perfusionist training have college degrees. Most programs prefer students with some college credit in science, particularly biology, chemistry, physics, anatomy, physiology and microbiology. Several programs require the candidate to have a health related baccalaureate degree and some health related work experience, particularly registered nursing.

Curricula of accredited programs include anatomy and pathology, physiology, chemistry, pharmacology, biochemistry, hematology and cardiology. Courses cover heart-lung bypass for adults, pediatric and infant patients undergoing heart surgery, long term supportive extracorporeal circulation and special applications of the technology. Curricula include clinical experience which incorporates and requires performance of an adequate number and variety of

circulation procedures. Full-time clinical practice of six months is scheduled in major medical centers under the supervision of a Certified Clinical Perfusionist (CCP).

Perfusionists do not need to be licensed or certified. However, certification is an important credential for advancement and employment within the field. Certification in this field is available through the American Board of Cardiovascular Perfusion (ABCP). To become certified, a candidate must satisfy the ABCP's education and clinical experience requirements and pass rigorous oral and written examinations. Nationally, there are approximately 1,500 Certified Clinical Perfusionists (CCPs).

The job duties of a perfusionist require intense concentration, maximum flexibility and rapid response to life and death situations. A perfusionist must be emotionally stable and able (mentally and physically) to react effectively to all situations in the operating room.

**INDUSTRIES THAT EMPLOY PERFUSIONISTS**

| SIC | Industry | Percentage of Occupation |
|---|---|---|
| 806 | Hospitals | 100% |

**OCCUPATIONAL EARNINGS**

According to a 1988 survey of program directors of accredited training programs, salaries of entry level certified perfusionists averaged $44,177. Noncertified new graduates of accredited education programs start at approximately $33,000 per year. Annual salaries for experienced perfusionists in Massachusetts range from $45,000 to $65,000. The relatively high salaries are a reflection of the difficulty and intensity of the job and keen competition for qualified workers.

**EMPLOYMENT OUTLOOK**

The demand for perfusionists stems from the early 1950s when open heart surgery became a feasible medical procedure. In the beginning, surgeons performed perfusion. Most job openings for perfusionists are at academic medical centers in major cities and other high population areas. Initial job opportunities for perfusionists are limited. However, experienced perfusionists, especially those who are certified, are in demand. The demand for blood recovery and recirculation during surgery has increased recently and should create further need for perfusionists. Perfusionists may advance to chief perfusionist or to teaching, administration or research positions by acquiring additional education and experience.

## RELATED OCCUPATIONS

Cardiopulmonary Technologist/Technicians
Electrocardiogram Technologists
Pulmonary-Function Technicians
Respiratory Therapists

## INSTITUTIONS PROVIDING TRAINING IN MASSACHUSETTS

New England Medical Center
750 Washington Street
Boston, MA 02111
617/956-5613

Northeastern University
360 Huntington Avenue
Boston, MA 02215
617/437-4183

## WHERE TO WRITE FOR MORE INFORMATION

American Society of Extra-Corporeal Technology
1980 Isaac Newton Square South
Reston, VA 22090
703/435-8556

American Board of Cardiovascular Perfusion
109 South 27th Avenue, #209
Hattiesburg, MS 39401
601/264-4491

## PHYSICAL THERAPISTS

Physical therapists and their assistants work with patients that have physical disabilities due either to injury or disease. These therapists develop and administer treatment to relieve pain or restore functioning and mobility for their patients and help prevent or limit permanent disabilities. Physical therapists often work with accident or stroke victims and physically challenged children, but they also help to treat people with degenerative diseases such as multiple sclerosis and chronic conditions such as arthritis. Some therapists specialize in areas like pediatrics, geriatrics, sports medicine or neurology.

The procedures that physical therapists use with their patients require a very thorough knowledge of human physiology and anatomy. Exercises are used to increase coordination and strength and to improve patients' range of motion. Therapists may provide massage or apply treatments of heat, cold, water, electricity or ultrasound to relieve pain, activate paralyzed muscles, or generally improve muscle and skin condition. Physical therapists need to develop relationships of trust and confidence with their patients, and also the patient's families when therapy treatments must be continued at home. Recordkeeping, in order to track patient progress and plan ongoing treatment, is another important part of a physical therapist's job.

Physical therapists' assistants administer many of the same treatments, but under the direction of a therapist. Assistants are not responsible for planning treatments or evaluating patients' progress.

While many physical therapists work in settings such as hospitals or clinics, which have specially equipped physical therapy departments, they must also be able to work in patients' homes. The job involves moving equipment and helping patients to walk, turn and stand, and thus it is physically demanding. Therapists, particularly those in private practice, have to schedule treatments at times that are convenient for their patients, and often work on evenings or weekends.

## EDUCATION, TRAINING AND HIRING REQUIREMENTS

A license is necessary to practice physical therapy in Massachusetts; trained therapists must pass an exam in order to become licensed. Education and training can be pursued through bachelor's degree programs in physical therapy, certificate programs (for those with bachelor's degrees in other fields), and master's degree programs. According to a recent survey by the Area Health Education Center, employers prefer physical therapists with a master's degree for supervisory positions, but a bachelor's degree is considered adequate for most staff therapist positions. Physical therapy assistants usually possess an associate's degree and must be licensed as well.

INDUSTRIES THAT EMPLOY PHYSICAL THERAPISTS

| SIC | Industry | Percentage of Occupation |
|---|---|---|
| 806 | Hospitals | 54.0% |
| 809 | Home and Allied Services, NEC | 18.8 |
| 804 | Offices of Other Health Practitioners | 8.3 |
| 805 | Nursing and Personal Care Facilities | 5.9 |
| 808 | Home Health Care Services | 4.6 |
| 801 | Offices and Clinics of Medical Doctors | 3.1 |

OCCUPATIONAL EARNINGS

Most physical therapists earn between $19,000 and $23,000 annually. Experienced therapists can earn as much as $28,000 per year. Physical therapy assistants earn between $11,000 and $16,000 per year.

EMPLOYMENT OUTLOOK

The outlook for physical therapists and their assistants is very good. Employment among therapists is projected to increase by more than 1,200 jobs by the year 2000. As the demand for services grows among people with physical disabilities, the number of physical therapist jobs will grow. For example, the number of elderly people aged 80 and older, who often face disabling conditions like arthritis or stroke, is growing rapidly. Services will also be needed for other age groups, for accident and disease victims who survive due to advances in medical technology, and for the growing number of exercise and sports enthusiasts. Advances in rehabilitation medicine and therapeutic techniques are likely to create additional demand.

Hospitals are expected to provide fewer new jobs for physical therapists than they have in the past, although they will remain a major employer. Therapists working in hospitals may see patients for a shorter period of intensive treatment and then refer them to therapists in other settings like nursing homes. Growth in the home health care field will also benefit physical therapists. It is possible that hospitals will respond to cost-containment pressure by using a larger ratio of assistants to therapists; in that case, opportunities for assistants will grow even more rapidly.

Job opportunities will occur in hospitals, rehabilitation facilities, home health agencies, nursing homes and private practice.

RELATED OCCUPATIONS

Occupational Therapists

## INSTITUTIONS PROVIDING TRAINING IN MASSACHUSETTS

Two-Year (Associate's)

Becker Junior College - Worcester
61 Sever Street
Worcester, MA 01609
508/791-9241

Endicott College
376 Hale Street
Beverly, MA 01915
508/927-0585

Lasell Junior College
1844 Commonwealth Avenue
Newton, MA 02166
617/243-2000

Newbury College
129 Fisher Avenue
Brookline, MA 02146
617/739-0510

North Shore Community College
3 Essex Street
Beverly, MA 01915
508/927-4850

Springfield Technical Community College
One Armory Square
Springfield, MA 01105
413/781-7822

Four-Year (Bachelor's) Degree:

Boston University
121 Bay State Road
Boston, MA 02215
617/353-2300

Gordon College
255 Grapevine Road
Wenham, MA 01984
508/927-2300

Northeastern University
360 Huntington Avenue
Boston, MA 02115
617/437-2000

Simmons College
300 The Fenway
Boston, MA 02115
617/738-2000

Springfield College
263 Alden Street
Springfield, MA 01109
413/788-3000

University of Lowell
Dugan Hall
Lowell, MA 01854
508/452-5000

Graduate Degree:

MGH Institute of Health Professions
15 River Street
Boston, MA 02108-3402
617/726-8010

## WHERE TO WRITE FOR MORE INFORMATION

American Physical Therapy Association
111 N. Fairfax Street
Alexandria, VA 22314

## PHYSICIAN ASSISTANTS

Physician assistants (PAs) is a relatively new occupation within the health care field. Sometimes called "physician's associates", PAs are trained to provide primary care under the direction of physicians. The occupation was created at a time (during the 1960s) when there was a shortage of physicians. PAs interview patients, take medical histories, give physical examinations, order tests, and sometimes make tentative diagnoses and prescribe treatments. Although they work under the direction of supervising physicians, PAs handle most of the tasks involved in routine patient care and medical treatment. An increasing number of PAs work in specialty areas, such as assisting physicians in surgery or pediatrics.

PAs work in hospitals and in other primary care settings, such as health maintenance organizations (HMOs), private practices and neighborhood health centers.

About 1,000 PAs are employed in Massachusetts, primarily in the eastern part of the state. In the Boston area, PAs are likely to be affiliated with one of the teaching hospitals; those outside of Boston typically work at HMOs, private practice or at neighborhood health centers.

## EDUCATION, TRAINING AND HIRING REQUIREMENTS

Northeastern University offers the only training program for PAs in Massachusetts. The Northeastern program involves two full years of course work and clinical training. Applicants are now required to have a bachelor's degree and, if accepted, may then work toward an additional bachelor's or a master's degree. Educational courses include anatomy, physiology, microbiology and pharmacology. Extensive hands-on health care experience is a prerequisite for most PA training programs. A master's degree often helps PAs who seek jobs in hospitals or other large institutions to get higher salaries. National certification (by the National Commission on Certification of Physician Assistants) is not required by law in Massachusetts, but many employers require it. Certified PAs are also required to take a formal re-certification test after they have worked for six years. In addition, one hundred hours of continuing education are required for every two years of practice as a PA; these must include formal training through conferences or hospital rounds, as well as less formal education gained through attending college courses or researching while preparing articles or lectures.

## INDUSTRIES THAT EMPLOY PHYSICIAN ASSISTANTS

| SIC | Industry | Percentage of Occupation |
|---|---|---|
| 801 | Offices & Clinics of Medical Doctors | 44.1% |
| 806 | Hospitals | 20.5 |
| 802 | Offices & Clinics of Dentists | 19.4 |
| 805 | Nursing & Personal Care Facilities | 11.4 |

## OCCUPATIONAL EARNINGS

Entry level salaries are usually between $20,000 and $25,000; most PAs earn between $25,000 and $35,000 a year, although some who gain extensive experience or work with highly paid physicians may earn $40,000 or more.

## EMPLOYMENT OUTLOOK

The outlook for PAs in Massachusetts appears positive, although long run trends are difficult to predict. PAs are currently few in number, but they may become increasingly attractive to hospitals that are seeking to combine quality of care with cost-effectiveness. Staff PAs offer similar advantages to HMOs. National Medicare legislation passed last year, which allows reimbursement for services provided by PAs, may open up new job opportunities in private practices and more dispersed, community-based settings. The underutilization of physician assistants in Massachusetts, combined with the shortage of physicians in inner cities and rural Massachusetts, should create additional demand. However, the demand for PAs may also be affected by high medical school enrollments and an increasingly large supply of practicing physicians in Eastern Massachusetts.

## RELATED OCCUPATIONS

Nurse Practitioners
Physical Therapists
Occupational Therapists

## INSTITUTIONS PROVIDING TRAINING IN MASSACHUSETTS

Four-Year (Bachelor's) Degree:

Northeastern University
360 Huntington Avenue
Boston, MA 02115
617/437-2200

## WHERE TO WRITE FOR MORE INFORMATION

Association of Physician Assistants
1117 North 19th Street, Suite 300
Arlington, VA 22209

National Commission on Certification
of Physician Assistants, Inc.
3384 Peachtree Road, N.E., Suite 560
Atlanta, GA 30326

## RADIATION THERAPY TECHNOLOGISTS

Radiation therapy technologists administer radiation therapy treatments under the prescription and instruction of a radiation oncologist (cancer specialist). The radiation treatments, using prescribed doses of ionizing radiation supplied and controlled through radiation producing equipment, are used widely in the management of cancer. These treatments destroy cancer cells without permanently damaging healthy tissues in the same area. Radiation therapy technologists make sure that the equipment is properly angled and spaced at the correct distance from the patient. Using special filters or wedges to help distribute the radiation beam correctly within the patient, technologists verify that only the treatment area of the patient is exposed. After the machine and the patient are positioned, technologists immobilize the patient by placing molds around and under the patient's body and limbs. Radiation therapists provide appropriate patient care, maintain pertinent records, and exercise judgement in the administration of prescribed courses of treatment, tumor localization and dosimetry (the measurement of radiation dose). Radiation therapy technologists are particularly concerned with the principles of radiation protection for the patient, self and others while carrying out the treatment.

## EDUCATION, TRAINING AND HIRING REQUIREMENTS

Radiation therapy is a specialty within the broader category of radiologic technology. Programs for radiation therapy technology may be one, two or four years in length, depending on program design, objectives and the degree or certificate awarded. Applicants for a one-year program must have graduated from an accredited program in radiography or be an allied health professional with specific demonstrated competencies, including college coursework in radiation physics. Applicants for two-year and four-year programs must be high school graduates with an educational background in basic science and mathematics. The curriculum of an accredited program includes medical ethics and law, medical terminology, radiation oncology, radiobiology, radiation physics, radiation protection, radiographic imaging an clinical dosimetry. Clinical experience is an essential part of the curriculum.

A few states license radiation therapy technologists. The American Registry of Radiologic Technologists (ARRT) provides professional registration which is an asset for those seeking employment or advancement. Upon successful completion of a national exam, technologists are designated RT(T), registered technologists (therapy).

## INDUSTRIES THAT EMPLOY RADIATION THERAPY TECHNOLOGISTS

| SIC | Industry | Percentage of Occupation |
|---|---|---|
| 806 | Hospitals | INA |
| 808 | Outpatient Care Facilities | INA |

## OCCUPATIONAL EARNINGS

According to a 1988 survey of program directors, salaries of entry level radiation therapy technologists averaged $23,170. In the northeast United States, graduates of radiation therapy technology programs received an average $24,478.

## EMPLOYMENT OUTLOOK

The demand for radiation therapy technologists is expected to be strong, in part because of the growing demand for diagnosis and treatment of cancer patients. Trends in the incidence of cancer and other malignancies will be the principal factor affecting demand for radiation therapists.

## RELATED OCCUPATIONS

Radiographers
Diagnostic Medical Sonographers
Nuclear Medicine Technologists
Cardiology Technologists
Cardiopulmonary Technologists
Cardiovascular Technologists
Perfusionists
Respiratory Therapists
Clinical Laboratory Technologists
Electrocardiograph Technicians
Electroencephalographic Technologists

## INSTITUTIONS PROVIDING TRAINING IN MASSACHUSETTS

Two-Year (Associate's) Degree:

Catherine Laboure College
2120 Dorchester Avenue
Boston, MA 02124
617/296-8300

Massachusetts College of Pharmacy & Allied Health
179 Longwood Avenue
Boston, MA 02115
617/732-2916

North Shore Community College
3 Essex Street
Beverly, MA 01915
508/922-6722

Quinsigamond Community College
670 West Boylston Street
Worcester, MA 01606
508/853-2300

Springfield Technical Community College
1 Armory Square
Springfield, MA 01105
413/781-7822

## WHERE TO WRITE FOR MORE INFORMATION

American Society of Radiologic Technologists
15000 Central Avenue, SE
Albuquerque, NM 87123

American Registry of Radiologic Technologists
2600 Wayzata Blvd.
Minneapolis, MN 20007

## RADIOLOGIC TECHNOLOGISTS

Radiologic technologists operate equipment that is used to diagnose medical problems and treat patients. These technologists have been known for some years as X-ray technologists; but they now often use other kinds of imaging technologies such as ultrasound and nuclear magnetic resonance, in addition to radiologic equipment, and thus have come to be called radiologic technologists. The diagnostic imaging equipment they operate includes X-ray machines, computerized axial tomography (CT) scanners and ultrasonic scanners, which help to diagnose problems by creating images of patients' internal organs and body tissues. The technologists who provide therapy to patients use other kinds of sophisticated equipment to transmit radiation.

The field of radiologic technology includes several specialized occupations: radiographers, also called radiologic technicians or X-ray technicians, who take X-ray films of different parts of the body for diagnosing medical problems; nuclear medical technologists, who use radiopharmaceuticals in diagnosis and treatment; radiation therapy technologists, who administer radiation to cancer patients; and ultrasound technologists, who record images of patients' bodies (usually cardiac and prenatal patients) with equipment that transmits sound waves at high frequencies. In each specialty, technologists prepare information for interpretation and diagnosis by physicians; any treatment or examination of patients is performed according to instructions from physicians.

Radiologic technologists must carefully follow regulations covering the use of radiation. Although federal legislation sets standards for training and the safe use of radiography, workers in the field face potential radiation hazards. These hazards may be reduced with safety devices like shields and badges that monitor radiation exposure.

## EDUCATION, TRAINING AND HIRING REQUIREMENTS

Formal training programs are generally required for each specialty within radiologic technology (although technicians working in physicians' offices may receive on-the-job training). Associate's degree programs in nuclear medicine, radiation therapy, diagnostic medical sonography (ultrasound) and radiography are offered at several community colleges in Massachusetts. Bachelor's degree programs in nuclear medicine technology are also available at state and private colleges.

In addition, a few hospitals offer certificate training programs for radiographers. Certificate programs may offer opportunities for trained radiologic technologists to specialize within the field or for other interested health professionals to change fields. These training programs often prefer that applicants have some background in a health profession.

Trained radiologic technologists can be registered by the American Registry of Radiologic Technologists, and credentials are also awarded by the Nuclear Medicine Technology Certification Board and the American Registry of Diagnostic Medical Sonographers. A license is not required for these occupations in Massachusetts.

## INDUSTRIES THAT EMPLOY RADIOLOGIC TECHNOLOGISTS

| SIC | Industry | Percentage of Occupation |
|---|---|---|
| 806 | Hospitals | 66.6% |
| 801 | Offices and Clinics of Medical Doctors | 22.9 |
| 901 | Federal Government | 3.8 |

## OCCUPATIONAL EARNINGS

The salaries of radiologic technologists and technicians vary according to education, experience and location; those with more specialized skills usually earn more. Annual salaries of nuclear medical and ultrasound technologists are between $20,000 and $28,000. Radiographers' salaries are at a slightly lower range, between $17,000 and $24,000, although radiography supervisors earn more (an average of $28,000). Average earnings for radiation therapy technologists are close to $25,000.

## EMPLOYMENT OUTLOOK

Overall, employment among radiologic technologists and technicians is projected to grow in Massachusetts, although the outlook for each specialty within the occupation is varied. Radiographers may face greater competition for available jobs, particularly in urban areas, due to a concentration of trained professionals in these locations. Advances in medical technology may also generate new job opportunities, particularly in outpatient facilities. The use of ultrasound tests is expected to increase in hospitals and in other health care settings such as doctors' offices and health maintenance organizations. Some employers train existing staff to use ultrasound equipment and thus may limit growth in new job opportunities. Trends in the hospital industry will have an important effect on each of these occupations, particularly if hospitals attempt to control costs by limiting the use of diagnostic radiology services, limiting purchases of expensive equipment, and cross-training staff.

In the years ahead, a growing number of radiologic technologists will find jobs in offices of physicians, health maintenance organizations, diagnostic imaging centers and free standing cancer clinics. Facilities such as these are expected to experience exceptionally rapid growth. However, opportunities for technologists may not increase proportionately because radiologic procedures in nonhospital settings sometimes are performed by physicians, nurses, medical assistants and other personnel.

## RELATED OCCUPATIONS

X-ray Technicians
Nuclear Medicine Technicians
Diagnostic Medical Sonographers

## INSTITUTIONS PROVIDING TRAINING IN MASSACHUSETTS

Certificate Program:

Goddard Memorial Hospital
909 Summer Street
Stoughton, MA 02072
617/344-5100

Massachusetts General Hospital
32 Fruit Street
Boston, MA 02114
617/726-3097

Mount Auburn Hospital
330 Mt. Auburn Street
Cambridge, MA 02138
617/499-5070

Two-Year (Associate's) Degree:

Bunker Hill Community College
New Rutherford Avenue
Charlestown, MA 02129
617/241-8600

Holyoke Community College
303 Homestead Avenue
Holyoke, MA 01040
413/538-7000

Catherine Laboure College
2120 Dorchester Avenue
Boston, MA 02124
617/296-8300

Massachusetts Bay Community College
50 Oakland Street
Wellesley Hills, MA 02181
617/237-1100

Massachusetts College of Pharmacy and Allied Health Sciences
179 Longwood Avenue
Boston, MA 02115
617/732-2800

Middlesex Community College
Springs Road
Bedford, MA 01730
617/275-8910

North Shore Community College
3 Essex Street
Beverly, MA 01915
508/927-4850

Northern Essex Community College
100 Elliot Street
Haverhill, MA 01830
508/374-0721

Quinsigamond Community College
670 West Boylston Street
Worcester, MA 01606
508/853-2300

Springfield Technical Community College
One Armory Square
Springfield, MA 01105
413/781-7822

Four-Year (Bachelor's) Degree:

University of Lowell
Dugan Hall
One University Avenue
Lowell, MA 01854
508/452-5000

**WHERE TO WRITE FOR MORE INFORMATION**

American Society of Radiologic Technologists
15000 Central Avenue, SE
Albuquerque, NM 87123

Society of Nuclear Medicine
136 Madison Avenue
New York, NY 10016

Society of Diagnostic Medical Sonographers
10300 N. Central Expressway
Building 1, Suite 276
Dallas, TX 75231

Vice President for Professional Education
American Cancer Society
90 Park Avenue
New York NY 10016

Division of Allied Health Education and Accreditation
American Medical Association
535 N. Dearborn Street
Chicago, IL 60610

## RECREATIONAL THERAPISTS AND EXPRESSIVE THERAPISTS

Recreational therapists, along with art, music and dance therapists, use art and leisure activities as a form of treatment for patients who have physical, mental or emotional disabilities or illness. Recreational and expressive therapy are used to help patients master everyday life skills, build confidence, develop social skills and express themselves. Therapists plan and organize group and individual activities for patients that are suited to their particular needs. They may organize athletic events, dances, arts and crafts, musical activities, trips to movies, dramatics, field trips, poetry readings and games. Apart from enjoyment, the activities are designed to provide opportunities for exercise, social participation, communication and accomplishment. These therapists often work with a team of other health professionals, who together plan treatments and monitor patients' progress.

Many recreational therapists work in rehabilitation or psychiatric hospitals, as well as nursing homes, residential care facilities, and community mental health centers. These therapists also help provide family respite care by organizing outings for disabled or retarded people living at home; some therapists work at camps or in programs for special needs children. In hospitals and nursing homes, recreational therapists are usually located in the activities department or therapy department, together with expressive therapists from such disciplines as music, dance and art. Therapists review medical records, talk with patients and their families to learn about their interests and hobbies, and discuss each resident's condition with other members of the staff. Recreational therapists carefully observe the patients' reactions to activities in order to develop and modify treatment plans. Nursing homes sometimes employ recreational therapists as activities directors or hire them to consult with activities staff.

The therapist in a community setting might work in a day care program for the elderly, for example, or in a program for mentally retarded or blind adults operated by a non-profit rehabilitation agency. Recreational therapists in community settings arrange transportation and escort services, if necessary, for respective participants. Expressive therapists use art, music and dance to unify body awareness and self-esteem, to strengthen motor skills and to foster a sense of pride through mastery. Through art and dance, the students experience motor-coordination and control. In creative modalities, students use the right hemisphere of the brain, a more intuitive, holistic problem-solving approach. For individuals with neurological disorders, alternative methods of problem solving and expression may be developed using different therapeutic approaches.

## EDUCATION, TRAINING AND HIRING REQUIREMENTS

Most recreational therapists hold a bachelor's degree in psychology, social work, or therapeutic recreation. A degree specifically in recreational therapy or in recreation with an emphasis on therapeutic recreation is the usual requirement for clinical positions. A bachelor's degree in social sciences, an associate degree or qualifying work experience fulfills hiring

requirements for many nursing home positions, where emphasis is on activities rather than therapy. Nursing homes with strong rehabilitation programs employ recreational therapists with degrees in therapeutic recreation. Massachusetts does not require licensure or certification for recreational therapists. However, many employers prefer to hire certified recreational therapists. Certification is available through the National Council for Therapeutic Recreation Certification (NCTRC), which awards credentials for therapeutic recreation specialists and therapeutic recreation assistants.

Academic programs in therapeutic recreation emphasize coursework in the physical, biological and behavioral sciences and require 360 hours of internship under the supervision of a certified therapeutic recreation specialist. The master's level creative art therapist is schooled in developmental psychology, group dynamics, psychodynamic principles and models, art techniques and activities, and systematic intervention skills.

## INDUSTRIES THAT EMPLOY RECREATIONAL AND EXPRESSIVE THERAPISTS

| SIC | Industry | Percentage of Occupation |
|---|---|---|
| 805 | Nursing and Personal Care Facilities | 65.5% |
| 806 | Hospitals | 24.5 |

## OCCUPATIONAL EARNINGS

Salaries of recreational therapists range from about $17,000 to $24,000 per year, depending on experience, with the typical salary being approximately $19,000. Some recreational therapists, particularly in nursing homes, work part-time.

## EMPLOYMENT OUTLOOK

Job opportunities for recreational therapists are expected to be excellent through the year 2000. As the population ages and the deinstitutionalization of psychiatric patients continues, there will be a growing need for recreational therapists in nursing homes and community programs. Because third-party reimbursement for recreational therapy services is limited, however, hospitals may be less likely to offer staff positions for recreational therapists. Most employment growth will probably be outside of hospitals, with the exception of private psychiatric hospitals, which are expected to continue to expand.

Because of better health care, persons with developmental disabilities are surviving longer and are able to live in the community. Major medical advances have increased the number of traumatically head injured and severely physically disabled adults who require day habilitation programs. The growing incidence of alcohol and drug dependency problems has also increased the need for recreational therapists. With the number of those 65 years of age and above doubling over the decade, more people will be prone to debilitating conditions that will require recreational therapy. All

these trends will contribute to the rising demand for therapeutic and mental health services in nursing homes, private psychiatric hospitals and community programs for the elderly, mentally ill and developmentally disabled and will generate opportunities for these therapists.

## RELATED OCCUPATIONS

Art Therapists
Music Therapists
Dance Therapists
Occupational Therapists
Corrective and Manual Arts Therapists
Rehabilitation Counselors

## INSTITUTIONS PROVIDING TRAINING IN MASSACHUSETTS

Four-Year (Bachelor's) Degree:

Northeastern University
360 Huntington Avenue
Boston, MA 02115
617/437-2000

Springfield College
263 Alden Street
Springfield, MA 01109
413/788-3136

## WHERE TO WRITE FOR MORE INFORMATION

National Therapeutic Recreation Society
3101 Park Center Drive
Alexandria, VA 22302

National Council for Therapeutic Recreation Certification
PO Box 16126
Alexandria, VA 22302

American Association on Health, Physical Education, Recreation and Dance
PO Box 704
Waldorf, MD 20601

Public Inquiries
National Institute of Mental Health
5600 Fishers Lane
Rockville, MD 20857

American Health Care Association
1200 15th Street, NW
Washington, DC 20005

National Recreation and Park Association
3101 Park Center Drive
Alexandria, VA 22302

American Association for Leisure and Recreation
1900 Association Drive
Reston, VA 22091

## REGISTERED NURSES

Registered Nurses (RNs) deal with health maintenance, as well as treatment for illness or injury; and they address patients' mental and emotional, as well as physical needs. While RNs are responsible for ensuring that medical treatment prescribed by doctors is carried out, they are also trained to assess patients' symptoms and progress, administer medications and teach patients and families about needed care.

RNs have different specific responsibilities in different work settings. Most of them work as hospital nurses, providing skilled bedside nursing care. These nurses typically work in areas of a hospital, such as surgery or pediatrics, where groups of patients need similar care. RNs employed in nursing homes care for chronically ill or convalescing patients. Many RNs work as private duty nurses, either in homes or institutional settings, where they are often hired to provide individual care to patients. RNs who work in home health care or in clinics or schools are called community health nurses. Physicians' offices and health maintenance organizations (HMOs) also employ RNs. Occupational health and industrial nurses treat people in the work place and may help with examinations, inoculations or health promotion programs.

## EDUCATION, TRAINING AND HIRING REQUIREMENTS

RNs must be licensed with the Board of Registration in Nursing in order to practice in Massachusetts. Three types of RN training programs may be pursued in this state. Diploma programs, which require three years, are offered at several hospitals; associate degree programs (two years) are offered at many community colleges; and bachelor's degree programs, requiring four years, are offered at several public and private colleges. Graduates from any of these programs are eligible to take the RN licensing exam. A bachelor's degree is important for nurses who want to pursue administrative jobs, research, teaching, or clinical specializations. These positions generally require graduate level preparation leading to either a certificate or a master's degree.

RNs can also become nurse practitioners, nurse anesthetists or nurse midwives, specialties that offer nurses the opportunity to advance within hospitals and also to work on an independent basis.

## INDUSTRIES THAT EMPLOY REGISTERED NURSES

| SIC | Industry | Percentage of Occupation |
|---|---|---|
| 806 | Hospitals | 66.1% |
| 805 | Nursing & Personal Care Facilities | 8.0 |
| 736 | Personnel Supply Services | 6.4 |
| 809 | Health & Allied Services, NEC | 5.2 |
| 801 | Offices & Clinics of Medical Doctors | 3.7 |
| 821 | Elementary & Secondary Schools | 2.5 |
| 901 | Federal Government | 2.4 |

| | | |
|---|---|---|
| 808 | Home Health Care Services | 1.4 |
| 902 | State Government | 1.0 |

## OCCUPATIONAL EARNINGS

Salaries for RNs vary among hospitals and other settings. Staff RNS in Massachusetts hospitals earn, on average, $26,000 per year. (The entry level salary is about $21,000.) Salaries in nursing homes are slightly lower, about $20,000 for general duty nurses and $23,000 for head nurses. Those who advance to become a head nurse or supervisor, a nursing instructor, or a nurse practitioner or clinical specialist in a hospital earn between $30,000 and $35,000. The highest paid positions are anesthetists and directors of nursing in hospitals, who earn between $40,000 and $50,000.

## EMPLOYMENT OUTLOOK

Currently the demand for RNs is very high in Massachusetts, particularly in hospitals. Because of cost and regulatory pressures, acute-care hospitals are now more likely to provide care to seriously ill patients for shorter periods of time; these employers seek RNs who are trained to perform a wide range of skilled nursing duties and who can use, or be trained to use, sophisticated equipment. As more patients seek care outside hospitals and as the elderly population grows, the demand for RNs in outpatient ambulatory care, nursing homes and home health care settings is also growing.

Overall employment in this occupation is projected to increase 32 percent or 17,000 jobs by the year 2000. Job prospects will be affected by the fact that fewer numbers of women are entering the nursing field. The decrease in nursing school enrollment, coupled with other career options available to women and the failure to attract more men to nursing has currently resulted in a critical nursing shortage. The combination of strong demand and more limited supply may have a positive effect on wages for RN positions, although the current tight labor market has also resulted in staffing problems and increased stress for many RNs.

## RELATED OCCUPATIONS

Nurse-Midwives
Nurse Practitioners
Nurse Anesthetists
Occupational Health Specialists

## INSTITUTIONS PROVIDING TRAINING IN MASSACHUSETTS

Two-Year (Associate's) Degree:

Berkshire Community College
West Street
Pittsfield, MA 01201
413/499-4660

Essex Agricultural and Technical Institute/Collegiate Division
Route 62
Danvers, MA 01923
508/774-0050

Massachusetts Bay Community College
50 Oakland Street
Wellesley Hills, MA 02181
617/237-1100

Northern Essex Community College
100 Elliott Street
Haverhill, MA 01830
508/374-0721

Quincy Junior College
34 Coddington Street
Quincy, MA 02169
617/786-8799

Four-Year Bachelor's Degree:

American International College
1000 State Street
Springfield, MA 01109
413/737-7000

Atlantic Union College
South Lancaster, MA 01561
508/365-4561

Boston College
Lyons Hall 120
Chestnut Hill, MA 02167
617/552-3100

Boston University
121 Bay State Road
Boston, MA 02215
617/353-2300

Curry College
1071 Blue Hill Avenue
Milton, MA 02186
617/333-0500

Eastern Nazarene College
23 East Elm Avenue
Wollaston, MA 02170
617/773-2372

Elms College
291 Springfield Street
Chicopee, MA 01013
413/598-8351

Fitchburg State College
160 Pearl Street
Fitchburg, MA 01420
508/345-2151

Northeastern University
(5 year program)
360 Huntington Avenue
Boston, MA 02115
617/437-2000

Salem State College
352 Lafayette Street
Salem, MA 01970
508/745-0556

Simmons College
300 The Fenway
Boston, MA 02115
617/738-2107

Southeastern Massachusetts
University
Old Westport Road
North Dartmouth, MA 02747
508/999-8605

University of Lowell
Dugan Hall
One University Avenue
Lowell, MA 01854
508/452-5000

University of Massachusetts-Amherst
255 Whitmore
Amherst, MA 01003
413/545-0222

University of Massachusetts-Boston
Harbor Campus
Boston, MA 02125
617/929-7102

Graduate Degree:

MGH Institute of Health Professions
15 River Street
Boston, MA 02108-3402
617/726-8010

**WHERE TO WRITE FOR MORE INFORMATION**

Communications Department
National League for Nursing
10 Columbus Circle
New York, NY 10019

American Nurses' Association
2420 Pershing Road
Kansas City, MA 64108

Recruitment and Placement Service
Veteran's Administration
810 Vermont Avenue, NW
Washington, DC 20420

American Hospital Association
Division of Nursing
840 North Lake Shore Drive
Chicago, IL 60611

American Health Care Association
1200 15th Street, NW
Washington, DC 20005

National Student Nurses' Association
555 W. 5th Street, Room 1325
New York, NY 10019
212/581-2211

American Nurses' Association
1101 14th Street, NW, Suite 200
Washington, DC 20005
202/789-1800

## REHABILITATION COUNSELORS

Rehabilitation counselors help persons with physical, developmental or emotional disabilities to develop the skills needed to obtain satisfying work and to lead fulfilling lives. They evaluate clients' disabilities and potential for employment and arrange for medical care, rehabilitation therapy, prosthetic devices, occupational training and job placement. Through interviews, rehabilitation counselors assist disabled persons to decide on a realistic vocational goal and help them plan for placement in satisfactory employment. The plan may not only involve extensive vocational training but also the development of work habits, confidence and motivation. In addition, rehabilitation counselors may interview clients' families, evaluate school and medical records and confer with physicians, psychologists, occupational therapists and employers. Counselors may administer various aptitude and interest tests or use work samples, job site evaluation and psychometric tests. If emotional problems seem to be interfering with adjustment, psychologists or psychiatrists may be consulted.

The actual vocational training may take place in a college, a vocational-technical school or in a sheltered job situation. While training is in process, rehabilitation counselors follow-up trainees to review their progress and to offer assistance. When the training is completed, counselors help trainees find employment. In order to provide job restructuring and selective placement, rehabilitation counselors may perform job analysis. Counselors make follow-up visits to insure that individuals are adjusting adequately to their work situations. In cases where disabled individuals are unable to enter or re-enter the labor market, counselors assist the client for adaptive living within family and social situations.

## EDUCATION, TRAINING AND HIRING REQUIREMENTS

Vocational and related rehabilitation agencies generally require a master's degree in rehabilitation counseling, counseling and guidance, or counseling psychology for rehabilitation counselor jobs. Some, however, may accept applicants with a bachelor's degree in rehabilitation services, counseling, psychology or related fields. Experience in employment counseling, job development, psychology, education or social work may be helpful.

In most state vocational rehabilitation agencies, applicants must pass a written examination and be evaluated by a board of examiners. Many employers require rehabilitation counselors to be certified. To become certified, counselors must meet educational and experience standards established by the Commission on Rehabilitation Counselor Certification and pass a written examination. They are then designated as "Certified Rehabilitation Counselors".

## INDUSTRIES THAT EMPLOY REHABILITATION COUNSELORS

| SIC | Industry | Percentage of Occupation |
|---|---|---|
| 920 | State Government, Except Education & Hospitals | INA |
| 832 | Individual and Family Social Services | INA |
| 836 | Residential Care | INA |
| 833 | Job Training and Vocational Rehabilitation Services | INA |
| 806 | Hospitals | INA |

## OCCUPATIONAL EARNINGS

Entry level salaries for rehabilitation counselors in Massachusetts range from $14,500-$25,700 per year. Rehabilitation counselors with graduate degrees earn somewhat higher wages. Typical earnings range from $17,000-$33,700 per year. Vocational Rehabilitation Counselors II employed by state government start at $445.70 per week.

## EMPLOYMENT OUTLOOK

Employment of rehabilitation counselors who work primarily for state and local government is expected to increase about as fast as the average for all occupations. Counselors with graduate degrees in rehabilitation or a related field have the best opportunity for employment.

## RELATED OCCUPATIONS

Social Workers
Psychologists
Psychiatrists
Occupational Therapists
Physical Therapists
Training and Employee Development Specialists
Mental Health Workers
Employment Counselors
Human Service Workers
Personnel Workers and Managers
Special Education Teachers

## INSTITUTIONS PROVIDING TRAINING IN MASSACHUSETTS

### Four-Year (Bachelor's) Degree

Boston University
121 Bay State Road
Boston, MA 02215
617/353-2300
(Master's and Bachelor's Programs)

Master's Degree

Northeastern University
360 Huntington Avenue
Boston, MA 02115
617/437-2000
(Master's Degree Program)

Springfield College
263 Alden Street
Springfield, MA 01109
413/788-3000
(Master's Degree Program)

**WHERE TO WRITE FOR MORE INFORMATION**

National Rehabilitation Counseling Association
633 S. Washington Street
Alexandria, VA 22314

National Council on Rehabilitation Education
c/o Maddux O'Malley, Inc.
2921 Ermine Way
Farmers Branch, TX 75234

Council on Rehabilitation Education
185 North Wabash Street, Room 1617
Chicago, IL 60601

Division of Resource Development
Rehabilitation Service Administration
US Department Education
330 C Street, SW
Washington, DC 20202

Commission on Rehabilitation Counselor Certification
1156 Shure Drive, Suite 350
Arlington Heights, IL 60004

## RESPIRATORY THERAPISTS AND TECHNICIANS

Respiratory therapists or inhalation therapists provide treatment to patients who have difficulty breathing due to heart and lung problems. They often respond to emergencies, treating victims of heart failure, drowning or shock; but they also care for patients with chronic conditions like asthma or emphysema. Respiratory care involves administering oxygen, keeping the respiratory tract moist with humidity and aerosol mists, clearing lungs and helping patients to breathe more easily, and operating mechanical ventilators. In addition to administering treatments and setting up and monitoring special equipment like ventilators, respiratory therapists also help with diagnostic procedures that measure blood oxygen levels or air volume in the lungs.

In many cases, patients who need oxygen can be treated by respiratory therapists in their own homes. Therapists also teach patients and families how to use ventilators and other more sophisticated equipment at home and help to maintain and repair the equipment. Therapists keep records of patient progress and materials used. Some therapists supervise respiratory technicians and assistants.

## EDUCATION, TRAINING AND HIRING REQUIREMENTS

Postsecondary training is required for all respiratory therapy workers, through either a two-year associate's degree or four-year bachelor's degree program. Respiratory technicians generally have an associate's degree and become certified by passing an examination. Registered therapists must have a bachelor's degree and must also sit for an exam.

Courses include biological and physical sciences basic to understanding the human breathing system, such as anatomy, physiology, medical terminology, chemistry, mathematics, microbiology, physics, therapeutic procedures, clinical medicine and clinical expressions.

Hospitals typically employ respiratory technicians, certified respiratory therapy technicians and registered respiratory therapists. Technicians who are not certified are limited in providing direct patient care but work with the same equipment as certified technicians and therapists. Certified technicians and registered therapists have similar job responsibilities, but registered therapists earn more and have better chances of upward mobility.

## INDUSTRIES THAT EMPLOY RESPIRATORY THERAPISTS AND TECHNICIANS

| SIC | Industry | Percentage of Occupation |
|---|---|---|
| 806 | Hospitals | 94.0% |
| 809 | Health and Allied Services, NEC | 5.0 |

## OCCUPATIONAL EARNINGS

Registered therapists earn between $18,000 and $25,000 annually. Certified respiratory therapy technicians' salaries are in the range of $16,000 to $23,000, while uncertified technicians can earn between $15,000 and $21,000.

## EMPLOYMENT OUTLOOK

Employment of respiratory therapists is expected to grow about 23 percent by the year 2000. The demand for respiratory therapy services is likely to continue, due largely to a rapidly growing older population and increasing incidence of cardiopulmonary diseases. Due to pressures to limit costs, however, there will probably be changes in the type and amount of respiratory care provided in hospitals. Hospitals may also change staffing patterns - replacing respiratory therapists with technicians or registered nurses - in order to cut labor costs. Job prospects for respiratory therapists are likely to be good in the home health care field, particularly in hospital-based programs, although this industry currently represents a relatively small share of therapist jobs.

## RELATED OCCUPATIONS

Dialysis Technicians
Emergency Medical Technicians
Registered Nurses
Occupational Therapists
Physical Therapists
Radiation Therapy Technologists

## INSTITUTIONS PROVIDING TRAINING IN MASSACHUSETTS

Two-Year (Associate's) Degree:

Berkshire Community College
West Street
Pittsfield, MA 01201
413/499-4660

Catherine Laboure College
2120 Dorchester Avenue
Boston, MA 02124
617/296-8300

Massasoit Community College
One Massasoit Blvd.
Brockton, MA 02402
508/588-9100

Newbury College
129 Fisher Avenue
Brookline, MA 02146
617/730-7061

North Shore Community College
3 Essex Street
Beverly, MA 01915
508/922-6722

Northern Essex Community College
100 Elliot Street
Haverhill, MA 01830
508/374-0721

Quinsigamond Community College
670 West Boylston Street
Worcester, MA 01606
508/853-2300

Springfield Tech. Community College
Armory Square
Springfield, MA 01105
413/781-7822

Four-Year (Bachelor's) Degree:

Northeastern University
360 Huntington Avenue
Boston, MA 02115
617/437-2000

## WHERE TO WRITE FOR MORE INFORMATION

American Association for Respiratory Therapy
1720 Regal Row, Suite 112
Dallas, TX 74221

Joint Review Committee for Respiratory Therapy Education
1701 Euless Blvd., Suite 200
Euless, TX 76040

The National Board for Respiratory Care, Inc.
11015 West 75th Terrace
Shawnee Mission, Kansas 66214

## SPEECH-LANGUAGE PATHOLOGISTS AND AUDIOLOGISTS

Speech-language pathologists and audiologists examine and provide remedial services for persons with speech and hearing disorders and perform research related to speech and language problems. Speech-language pathologists are primarily concerned with persons who have speech, language and voice disorders, while audiologists concentrate on individuals with hearing problems.

Speech pathologists diagnose and treat children and adults who have speech, language and voice disorders from such causes as total or partial hearing loss, neurological and emotional problems, mental retardation, cleft lip/palate, brain injury, cerebral palsy, lisping, stuttering, or foreign or regional dialect. Speech therapists evaluate individuals' speech and language abilities. They use a variety of tools for treatment purposes including audiovisual equipment and computers. Microcomputers may be employed to analyze specific characteristics of the speech signal, to provide visual cues for the patient, or to present stimuli and record responses during practice sessions. Tape recorders, mirrors and audiovisual tapes are used to assist clients to hear and to see their speech patterns and word formation. Through observation of the mouth and tongue placement of the therapist, the patient repeats the sounds articulated by the teacher. In addition, speech therapists counsel patients and families about communication disorders and about coping with the frustration and stress that may accompany speech and hearing problems.

Audiologists assess and treat hearing problems and may specialize in diagnostic testing, remediation, counseling, instruction or research related to hearing disorders. They also are concerned with the prevention of hearing loss and the conservation of hearing in children and adults. Audiologists assess the type and degree of hearing impairment using an audiometer to measure the loudness levels at which sound becomes audible at various frequencies. The audiologist sets the equipment to emit sounds at various intensities and pitch levels and then instructs the person being tested to signal whenever a sound is heard. They differentiate between organic and inorganic causes of hearing impairment. The audiologists's assessment is used to determine a diagnosis and a treatment plan which may require an implant or hearing aids. Audiologists may recommend telephone and television amplifiers, telephone decoders (TDDs), closed caption television decoders and signaling devices. The aural rehabilitation plan may include auditory training, speech reading, speech conservation, counseling and guidance.

Speech-language pathologists and audiologists in schools generally work with administrators in developing programs, counsel parents on prevention and assist teachers with classroom activities to develop verbal communication skills. Most speech and hearing therapists do some administrative work. They keep a variety of records, reports and schedules.

## EDUCATION, TRAINING AND HIRING REQUIREMENTS

A master's degree in speech-language pathology or audiology is standard. State licensing and Medicare and Medicaid reimbursement requires a master's degree and completion of 300 hours of supervised clinical practice. An advanced degree in speech-language pathology or audiology is required for certification by the American Speech, Language and Hearing Association. Speech and hearing specialists in public schools must have a practice certificate issued by the State educational agency. In many states, individuals with less than a master's degree in speech-language pathology or audiology work as special education teachers rather than speech-language pathologists or audiologists.

In 36 states, licenses are required for those offering speech-language pathology and audiology services in private practice, clinics or other settings outside of schools. In Massachusetts, licensed speech-language pathologists and audiologists must possess a bachelor's degree and a master's degree or equivalent in speech-language pathology or audiology from an accredited college or university. They are required to have completed a supervised clinical experience of a minimum of 300 hours with patients who represent a variety of clinical disorders and a supervised professional practice of nine months full-time professional experience in which bona fide clinical work has been accomplished. In addition, they must pass the written national exam.

About 235 colleges and universities offered master's programs in speech-language pathology and audiology in 1987. Approximately two-thirds of the master's degree programs were accredited by the American Speech-Language-Hearing Association (ASHA). Courses include advanced anatomy and physiology of the areas involved in hearing, speech and language; acoustics; psychological aspects of communication; quantitative measurement; and analysis of speech production, language abilities and auditory processes. Graduate students also take courses in the nature, evaluation and treatment of speech, language and hearing disorders and receive supervised clinical training in communicative disorders. It is recommended that applicants to graduate programs complete coursework in phonetics, anatomy and physiology of the speech mechanism and speech acoustics.

Most individuals with a master's degree acquire the Certificate of Clinical Competence (CCC), either in speech-language pathology (CCC-SLP) or in audiology (CCC-AUD), offered by the American Speech-Language-Hearing Association. To earn the CCC, a person must have a master's degree or its equivalent, complete a 9-month internship and pass a national written examination.

## INDUSTRIES THAT EMPLOY SPEECH-LANGUAGE PATHOLOGISTS AND AUDIOLOGISTS

| SIC | Industry | Percentage of Occupation |
|---|---|---|
| 821 | Elementary and Secondary Schools | 63.0% |
| 806 | Hospitals | 17.5 |

## OCCUPATIONAL EARNINGS

According to a 1986 survey conducted by the University of Texas Medical Branch, the average starting salary for speech-language pathologists and audiologists in hospitals and medical centers was approximately $22,500. Experienced workers averaged about $28,000.

Most speech-language pathologists and audiologists working in public schools are classified as teachers or special education teachers. In Massachusetts, typical salary levels for teachers range from $16,500 to $30,000.

## EMPLOYMENT OUTLOOK

Employment of speech and hearing therapists in Massachusetts is expected to grow as fast as the average for all occupations through the year 2000. Changes in the size and age structure of the population will mean a substantial increase in the number of persons with communicative disorders. Because hearing loss is strongly associated with old age, the very rapid increase in the elderly population will cause the number of hearing-impaired persons to expand. Many survivors of head trauma injuries and strokes will need speech rehabilitation services.

The increased demand for rehabilitation services will generate new jobs in this occupation at speech and hearing clinics, physician's offices and outpatient care facilities.

In response to the Education for All Handicapped Children Act of 1975 and its 1986 amendment, the substantial growth in the number of speech and hearing therapists in school systems should continue. This provision, combined with a projected elementary school enrollment increase, is expected to create more jobs for special education personnel.

Demand for speech-language pathologists and audiologists is expected to rise in long-term care facilities and home health agencies although many positions will be filled by private practitioners under contract. The number of private practitioners - although small - is likely to rise because of the flexibility in treatment site and reimbursement patterns. New opportunities for consultant audiologists are expected as manufacturing firms and others develop and implement noise control programs.

## RELATED OCCUPATIONS

Occupational Therapists
Physical Therapists
Recreational Therapists
Rehabilitation Counselors

## INSTITUTIONS PROVIDING TRAINING IN MASSACHUSETTS

### Two-Year (Associate's) Degree

Mount Ida College
777 Dedham Street
Newton Centre, MA 02159
617/969-7000

### Four-Year (Bachelor's) Degree

Boston University
121 Bay State Road
Boston, MA 02215
617/353-2000

Bridgewater State College
Tillinghast Hall
Bridgewater, MA 02324
508/697-1200

Elms College
291 Springfield Street
Chicopee, MA 01013-2839
413/594-2761

### Graduate Degree

Boston University
121 Bay State Road
Boston, MA 02215
617/353-2000

Emerson College
100 Beacon Street
Boston, MA 02116
617/578-8500

Northeastern University
360 Huntington Avenue
Boston, MA 02115
617/437-2000

University of Massachusetts, Amherst
255 Whitmore
Amherst, MA 01003
413/545-0111

Worcester State College
486 Chandler Street
Worcester, MA 01602
508/793-8000

## WHERE TO WRITE FOR MORE INFORMATION

American Speech-Language-Hearing Association
10801 Rockville Pike
Rockville, MD 20852

## SURGICAL TECHNOLOGISTS AND TECHNICIANS

Surgical technologists/technicians or operating room technicians prepare instruments and materials for use in the operating room and may assist in their use during surgery. Under the supervision of surgeons or registered surgical nurses, they prepare patients for surgery by washing, shaving and disinfecting body areas where the surgeon will operate. They help stock and set up the operating arena with surgical instruments, equipment, sterile linens, fluids and other supplies. During the surgery, surgical technologists may pass sterile instruments to the surgeon, hold retractors and cut sutures as directed. In addition, they adjust lights and equipment and count sponges, needles and instruments used in surgery. Surgical orderlies help prepare, care for and dispose of specimens taken for laboratory analysis during the operation and may help apply dressings. Following the operation, they help clean and disinfect the operating room and restock it for the next operation.

## EDUCATION, TRAINING AND HIRING REQUIREMENTS

Nearly all surgical technologists/technicians receive their training in formal programs offered by community and junior colleges and vocational/technical schools. Programs vary in length from six to twenty months. Community college programs last two years and lead to an associate degree. Candidates should be high school graduates with courses in algebra, chemistry and biology. Shorter programs are available for students who have completed training for practical nursing. Programs from nine months to a year are designed for high school graduates with no background in health care.

Accredited programs provide classroom training as well as supervised clinical experience. Instruction includes anatomy, physiology, microbiology, pharmacology, pathology, asepsis and anesthesia. Other courses cover topics such as the proper use, care and sterilization of surgical equipment and patient transportation. Supervised clinical practice in surgical procedures is provided for a variety of surgical specialties. The Liaison Committee on Certification confers professional certification which is helpful in seeking employment.

## INDUSTRIES THAT EMPLOY SURGICAL TECHNOLOGISTS AND TECHNICIANS

| SIC | Industry | Percentage of Occupation |
|---|---|---|
| 806 | Hospitals | 99.2% |

## OCCUPATIONAL EARNINGS

According to a 1988 survey, the average entry level salary for a surgical technologist was $15,015. In the northeast United States, the average starting salary was $17,419. Experienced technicians earned incomes of $25,000 and higher. Salaries vary widely depending upon the experience and

education of the individual, the economy of the region, the responsibilities of the position and the working hours.

## EMPLOYMENT OUTLOOK

Employment in this field in Massachusetts is expected to grow about as fast as the average for all occupations. Future prospects for surgical technicians will be affected by the volume of surgery, surgical practice patterns and the availability of operating room nurses. Surgical procedures have climbed steadily among the elderly. There has been a shift to outpatient or ambulatory surgery. Shortages or surpluses in the supply of surgical nurses are quite likely to affect the demand for surgical technicians. In areas experiencing a nursing shortage, opportunities for surgical technicians should be favorable.

## RELATED OCCUPATIONS

Chiropractor Assistants
Dental Assistants
Electrocardiograph Technicians
Electroencephalographic Technologists
Licensed Practical Nurses
Medical Assistants
Nursing Aides/Orderlies
Occupational Therapy Assistants
Physical Therapy Aides

## INSTITUTIONS PROVIDING TRAINING IN MASSACHUSETTS

Certificate:

Fanning School of Health and Technical Occupations
251 Belmont Street
Worcester, MA
508/799-1976

Essex Agricultural-Technical
Maple Street
Hathorne, MA 01937
508/774-0050

Northern Berkshire Voc-Tech
Hodges Cross Road
North Adams, MA 01247
413/663-5383

Quincy Junior College
34 Coddington Street
Quincy, MA 02169
617/984-1692

Two-Year (Associate's) Degree:

Springfield Tech. Comm. College
Armory Square
Springfield, MA 01105
413/781-6470

## WHERE TO WRITE FOR MORE INFORMATION

Association of Surgical Technologists
8307 Shaffer Parkway
Littleton, CO 80127

# APPENDIX

## ALPHABETIC INDEX TO TRAINING INSTITUTIONS LISTED IN THIS DIRECTORY

American International College
1000 State Street
Springfield, MA 01109
413/737-7000
Programs: MLT, RN

Anna Maria College
Sunset Lane
Paxton, MA 01612-1198
508/757-4586
Programs: MLT, MSW, NMT

Aquinas Junior College- Milton
303 Adams Street
Milton, MA 02186
617/696-3100
Program: MA

Aquinas Junior College- Newton
15 Walnut Park
Newton, MA 02158
617/969-4400
Program: MA

Assumption College
500 Salisbury Street
Worcester, MA 01609
508/752-5615
Program: MLT

Atlantic Union College
Main Street
South Lancaster, MA 01561
508/365-4561
Program: MSW, RN

Bay Path Junior College
588 Longmeadow Street
Longmeadow, MA 01106
413/567-0621
Program: MA

Baystate Medical Center
759 Chestnut Street
Springfield, MA 01199
413/784-4520
Program: MLT

Becker Junior College
3 Paxton Street
Leicester, MA 01524
508/892-8122
Programs: MA, SHS, OT, PT

Belchertown State School
17 Hospital Dr., PO Box 486
Belchertown, MA 01007
413/323-6311
Program: EMT

Berkshire Community College
West Street
Pittsfield, MA 01201
413/499-4660
Programs: EMT, LPN, SHS, RN, RTT, ResT

Berkshire Medical Center
725 North Street
Pittsfield, MA 01201
413/447-2000
Program: EMT, MLT

Boston City Hospital
818 Harrison Avenue
Boston, MA 02118
617/424-5000
Program: EMT

Boston College
140 Commonwealth Avenue
Chestnut Hill, MA 02167
617/552-8000
Programs: MSW, RN

Boston University
121 Bay State Road
Boston, MA 02215
617/353-2300
Programs: MSW, OT, PT, RN, RC, SLPA

Bridgewater State College
Tillinghast Hall
Bridgewater, MA 02324
508/697-1200
Programs: MSW, SLPA

Bristol Community College
777 Elsbree Street
Fall River, MA 02720
508/678-2811
Programs: DH, EMT, MLT, SHS

Bryman School
323 Boylston Street
Brookline, MA 02146
617/232-6035
Program: DA

Bunker Hill Community College
New Rutherford Avenue
Charlestown, MA 02129-2925
617/241-8600
Programs: EMT, PsA, NMT, RT

Cambridge Hospital
1493 Cambridge Street
Cambridge, MA 02139
617/498-1228

Cape Cod Community College
Route 132
West Barnstable, MA 02668
508/362-2131
Program: DH

Curry College
1071 Blue Hill Avenue
Milton, MA 02186
617/333-0500
Program: RN

Dean Junior College
99 Main Street
Franklin, MA 02038
508/528-9100
Program: MA, SHS

Diman Regional Vocational Technical
High School
Stonehaven Road
Fall River, MA 02723
508/678-2891
Program: DA, NA

Eastern Nazarene College
23 East Elm Avenue
Quincy, MA 02170
617/773-6350
Programs: MSW, RN

Elms College
291 Springfield Street
Chicopee, MA 01013
413/594-2761
Programs: MLT, MSW, RN, SLPA

Emerson College
100 Beacon Street
Boston, MA 02116
617/578-8500
Program: SLPA

Emerson Hospital
Old Road to Nine Acre Road
Concord, MA 01742
508/369-1400, Ext. 1459
Program: EMT

Emmanuel College
No. 400 The Fenway
Boston, MA 02115
617/735-9715
Program: MLT

Endicott College
376 Hale Street
Beverly, MA 01915
617/927-0585
Programs: MA, MRT, PT

Essex Agricultural and Technical
Institute- Collegiate Division
562 Maple Street
Hathorne, MA 01937-0362
508/774-0050
Program: D&N, LPN, NA, RN, ST

Fanning School of Health
Occupations
251 Belmont Street
Worcester, MA 01608
508/799-1940
Programs: DA, ST

Fitchburg State College
160 Pearl Street
Fitchburg, MA 01420
508/345-2151
Programs: MLT, RN

Forsyth School for Dental Hygienists
140 The Fenway
Boston, MA 02115
617/262-5200
Programs: DH

Framingham State College
100 State Street
Framingham, MA 01701
508/620-1220
Programs: D&N, LPN

Franklin Institute of Boston
41 Berkeley Street
Boston, MA 02116
617/423-4630
Program: BET

Goddard Memorial Hospital
909 Summer Street
Stoughton, MA 02072
617/344-5100
Program: RT

Gordon College
255 Grapevine Road
Wenham, MA 01984
508/927-2300
Program: PT

Holyoke Community College
303 Homestead Avenue
Holyoke, MA 01040
413/538-7000
Programs: D&N, MRT, RT, SHS

Laboure College
2120 Dorchester Avenue
Dorchester, MA 02124
617/296-8300
Programs: D&N, EEG, EMT, MRT, RTT, RT, ResT

Lasell College
1844 Commonwealth Avenue
Newton, MA 02166
617/243-2000
Programs: PT, SHS

Lawrence General Hospital
1 General Street
Lawrence, MA 01842
508/683-4000
Programs: MLT

Leonard Morse Hospital
67 Union Street
Natick, MA 01760
508/653-3400
Program: EMT

Marlborough Hospital
57 Union Street
Marlborough, MA 01752
508/485-1121, Ext. 234
Program: EMT

Massachusetts Bay Community College
50 Oakland Street
Wellesley Hills, MA 02181
617/237-1100
Programs: LPN, MLT, MRT, RN

Massachusetts College of Pharmacy
and Allied Health Sciences
179 Longwood Avenue
Boston, MA 02115
617/732-2800
Programs: NMT, RTT, RT

Massachusetts General Hospital
Institute of Health Professions
15 River Street
Boston, MA 02108-3402
617/726-3097
Programs: DMS, PT, RT

Massachusetts Maritime Academy
Academy Drive
Buzzards Bay, MA 02532
508/759-5761
Program: EMT

Massasoit Community College
The Technical Institute at Blue Hills
100 Randolph Street
Canton, MA 02021
617/838-5800
Programs: MA, MLT, RTT, ResT, SHS

Mercy Hospital
271 Carew Street
Springfield, MA 01102-9012
413/781-9100
Program: MLT

Merrimack College
Turnpike Street
North Andover, MA 01845
508/683-7111
Program: MLT, SHS

Middlesex Community College
Springs Road
Bedford, MA 01730
617/275-8910
Programs: DA, DH, DMS, EKG, EMT, MLT, PsA, RT

Montachusett Regional Voc-Tech
1050 Westminster Street
Fitchburg, MA 01420
508/345-9200
Program: DA

Mount Auburn Hospital
330 Mount Auburn Street
Cambridge, MA 02238
617/492-3500
Program: EMT, RT

Mount Ida-Chamberlayne College
777 Dedham Street
Newton Center, MA 02159
617/969-7000
Programs: MA, SHS, SLPA

Mount Wachusett Community College
444 Green Street
Gardner, MA 01440
508/632-6600
Program: MLT, PsA

New England Medical Center
750 Washington Street
Boston, MA 02111
617/956-5613
Program: P

Newbury College
129 Fisher Avenue
Brookline, MA 02146
617/739-0510
Programs: MA, PT, RTT, ResT

North Adams State College
Church Street
North Adams, MA 01247
413/664-4511
Program: MLT

Northeastern University
360 Huntington Avenue
Boston, MA 02115
617/437-2000
Programs: EMT, LPN, MRT, P, PT, PA, RecT, RN, RC, RT, RTT, ResT, SLPA

North Shore Community College
3 Essex Street
Beverly, MA 01915
508/922-6722
Programs: EMT, OT, PsA, PT, RT, RTT, ResT, SHS

Northern Essex Community College
100 Elliott Way
Haverhill, MA 01830
508/374-3900
Programs: LPN, MRT, PsA, RT, RN, RTT, ResT

Quincy Hospital
114 Whitwell Street
Quincy, MA 02169
617/773-6100
Program: EMT

Quincy Junior College
34 Coddington Street
Quincy, MA 02169
617/786-8799
Programs: LPN, RN, ST

Quinsigamond Community College
670 West Boylston Street
Worcester, MA 01606
508/853-2300
Programs: BET, DH, EMT, OT, RT, RTT, ResT

Regis College
235 Wellesley Street
Weston, MA 02193
617/893-1820
Programs: MLT, MSW

Salem State College
352 Lafayette Street
Salem, MA 01970
508/741-6100
Programs: MLT, MSW, NMT, RN

Simmons College
No. 300 The Fenway
Boston, MA 02115
617/738-2107
Programs: D&N, PT, MLT, MSW, RN

Smith College
Elm Street
Northampton, MA 01063
413/585-2700
Programs: MSW

Southeastern Massachusetts University
Old Westport Road
North Dartmouth, MA 02747
508/999-8605
Programs: MLT, RN

Southeastern Regional Vocational Technical HS
250 Foundry Street
South Easton, MA 02375
508/238-4374
Programs: DA

Springfield College
263 Alden Street
Springfield, MA 01109
413/787-3136
Programs: MLT, PT, RT, RN, RecT

Springfield Technical Community College
One Armory Square
Springfield, MA 01105
413/781-7822
Programs: BET, DA, DH, MA, NMT, PT, RTT, RT, ResT, SHS

Stonehill College
320 Washington Street
North Easton, MA 02357
508/238-1081
Program: MLT

Suffolk University
Eight Ashburton Place
Boston, MA 02114
617/573-8000
Programs: MLT, SHS

Tufts University
College Avenue
Medford, MA 02155
617/628-5000
Program: OT

University of Lowell
One University Avenue
Lowell, MA 01854-9985
508/452-5000
Programs: EMT, MLT, PT, RT, RN

University of Massachusetts-Amherst
Massachusetts Avenue
Amherst, MA 01003
413/545-0222
Programs: D&N, MLT, RN, SLPA

University of Massachusetts- Boston Harbor Campus
Boston, MA 02125-3393
617/929-7000
Programs: MLT, RN

University of Massachusetts Medical Center/Worcester State College
55 Lake Avenue, North
Worcester, MA 06655
508/856-4254
Program: NMT

Veterans Administration Medical Center
150 South Huntington Avenue
Boston, MA 02130
617/739-3471
Program: MLT

Western New England College
1215 Wilbraham Road
Springfield, MA 01119
413/782-3111
Program: MSW

Wheelock College
200 The Riverway
Boston, MA 02215
617/734-5200
Program: MSW

Worcester State College
486 Chandler Street
Worcester, MA 01602-2597
508/793-8040
Programs: OT, SLPA

## PROGRAM CODES

| Code | Occupation |
|---|---|
| BET | Biomedical Equipment Technicians |
| D&N | Dietitians and Nutritionists |
| DA | Dental Assistants |
| DH | Dental Hygienists |
| DMS | Diagnostic Medical Sonographers |
| EEG | EEG Technologists and Technicians |
| EKG | Electrocardiograph Technicians |
| EMT | Emergency Medical Technicians |
| LPN | Licensed Practical Nurses |
| MA | Medical Assistants |
| MLT | Medical Laboratory Technicians and Technologists |
| MRT | Medical Records Technicians |
| MSW | Medical Social Workers |
| NA | Nursing Aides |
| NMT | Nuclear Medical Technologists |
| OT | Occupational Therapists |
| P | Perfusionists |
| PA | Physician Assistants |
| PsA | Psychiatric Aides |
| PT | Physical Therapists |
| RC | Rehabilitation Counselors |
| RecT | Recreational Therapists |
| ResT | Respiratory Therapists and Technicians |
| RN | Registered Nurses |
| RT | Radiologic Technologists |
| RTT | Radiation Therapy Technologists |
| SHS | Social or Human Services Aides |
| SLPA | Speech-Language Pathologists and Audiologists |
| ST | Surgical Technologists and Technicians |

## BRIEF DESCRIPTIONS OF ALLIED HEALTH OCCUPATIONS

Health Care Maintenance and Treating Workers

**Registered Nurses (Registered Nurse Midwives; Nurse Anesthetists; Nursing Supervisors; Nurse Practitioners; General Duty Nurses; etc.):** Administer nursing care to ill or injured persons. Licensing or registration required.

**Licensed Practical Nurses:** Care for ill, injured, convalescent and handicapped persons in hospitals, clinics, private homes, sanitariums and similar institutions.

**Emergency Medical Technicians (Paramedics, EMTs, etc.):** Administer first aid treatment and transport sick or injured persons to medical facilities working as a member of an emergency medical team.

**Physician's Assistants (Ophthalmic Medical Assistants; Orthopedic Physicians's Assistants; Surgeon's Assistants; Gynecological Assistants; Pediatric Physician's Assistants; etc.):** Provide patient services under direct supervision and responsibility of doctor of medicine or osteopathy. Elicit detailed patient histories and do complete physical examinations. Reach tentative diagnosis and order appropriate laboratory tests. Requires substantial educational preparation, usually at colleges or junior colleges. Most physician's assistants complete two years of formal training, but training may vary from one to five years depending on the nature of the training and previous education and experience. May require certification.

**Opticians, Dispensing and Measuring:** Design, measure, fit and adapt lenses and frames for client according to written optical prescription or specification. Assist client with selecting frames according to style and color. Measure customer for size of eyeglasses and coordinate frames with facial and eye measurements and optical prescription. Prepare work order or optical laboratory containing instructions for grinding and mounting lenses in frames; verify exactness of finished lens spectacles. Adjust frame and lens position to fit client. May shape or reshape frames.

**Pharmacists (Druggists; Registered Pharmacists; etc.):** Compound and dispense medications following prescriptions issued by physicians, dentists or other authorized medical practitioners.

**Dietitians and Nutritionists (Public Health Nutritionists, etc.):** Organize, plan and conduct food service or nutritional program to assist in promotion of health and control of disease. May administer activities of department providing quantity food service. May plan, organize and conduct programs in nutritional research.

**Dietetic Technicians:** Provide service in assigned areas of food service management. Teach principles of food and nutrition and provide dietary counseling under direction of Dietitians.

Other Health Professionals, Paraprofessionals and Technicians

**Medical and Clinical Laboratory Technologists (Immunohematologists; Cytotechnologists; Microbiology Technologists; Chief Medical Technologists; Hematology Technologists; Biochemistry Technologists; etc.):** Perform a wide range of complex procedures in the general areas of the clinical laboratory or perform specialized procedures in such areas as cytology, histology and microbiology. Duties may include supervising and coordinating activities of workers engaged in laboratory testing.

**Cytotechnologists:** Study and detect changes in body cells for the diagnosis of cancer and other disease processes.

**Medical and Clinical Laboratory Technicians (Histological Technicians; Tissue Technicians; Blood Bank Technicians; Serology Technicians; Cytotechnicians; etc.):** Perform routine tests in medical laboratory for use in treatment and diagnosis of disease. Prepare vaccines, biologicals and serums for prevention of disease. Prepare tissue samples for Pathologists, take blood samples and execute such laboratory tests as urinalysis and blood counts. May work under the general supervision of a Medical Laboratory Technologist.

**Histologic Technicians/Technologists:** Prepare and study human or animal tissues for diagnostic, research or teaching purposes.

**Dental Hygienists (Oral Hygienists, etc.):** Perform dental prophylactic treatments and instruct groups and individuals in the care of the teeth and mouth.

**Medical Records Technicians (Medical Records Specialists, etc.):** Compile and maintain medical records of hospital and clinic patients.

**Nuclear Medicine Technologists (Radioisotope Technicians, etc.):** Prepare, administer and measure radioactive isotopes in therapeutic, diagnostic and tracer studies utilizing a variety of radioisotope equipment. Prepare stock solutions of radioactive materials and calculate doses to be administered by Radiologists. Subject patients to radiation. Execute blood volume, red cell survival and fat absorption studies following standard laboratory techniques.

**Radiologic Technologists (Diagnostic Medical Sonographers):** Take X-rays, CATscans, or administer nonradioactive materials into patient's blood stream for therapeutic purposes. Demonstrate portions of the human body on X-ray film or fluoroscopic screen. Includes modalities such as computed tomography, ultrasound and magnetic resonance.

**Radiologic Technicians (X-Ray Technicians, etc.):** Maintain and safely use equipment and supplies necessary to demonstrate portions of the human body on X-ray film or fluoroscopic screen for diagnostic purposes.

**Electroencephalograph Technologists (Electroneurodiagnostic Technicians; EEG Technicians, etc.):** Measure impulse frequencies and differences in electrical potential between various portions of the brain using equipment

that records data as a series of irregular lines on a continuous graph to be used by medical practitioner in diagnosing brain disorders.

**Cardiology Technologists (Pulmonary Function Technicians; Cardiopulmonary Technicians; Cardiovascular Technicians; Cardiac Technicians; Cardiac Catheterization Technicians; Echocardiographers; etc.):** Conduct tests of pulmonary and/or cardiovascular systems of patients to diagnose pulmonary and/or cardiovascular disorders. May conduct or assist in electrocardiogram, cardiac catheterization, pulmonary-function, lung capacity and similar tests.

**Electrocardiograph Technicians (ECG Technicians; Holter Scanning Technicians; EKG Technicians; etc.):** Record electromotive variations in action of heart muscle using electrocardiograph machine to provide data for diagnoses of heart ailments.

**Surgical Technologists and Technicians (Surgical Orderlies, etc.):** Perform any combination of the following tasks either before, during or after an operation: Prepare patient by washing, shaving, etc; place equipment and supplies in operating room according to surgeon's instruction; arrange instruments under direction of nurse; maintain specified supply of fluid levels for use during operation; adjust lights and equipment as directed; clean operating room; count sponges, needles and instruments used during operation; assist in administering blood, plasma or other transfusions or injections; and may hand surgeon instruments and supplies, hold retractors and cut sutures as directed.

**Psychiatric Technicians (Mental Heath Technicians, etc.):** Provide nursing care to mentally ill, emotionally disturbed or mentally retarded patients and participate in rehabilitation and treatment programs. Help with personal hygiene. Administer oral medications and hypodermic injections, following physician's prescriptions and hospital procedures. Monitor patients physical and emotional well-being and report to medical staff.

Therapists: Includes persons engaged in administering health treatment to patients with disabilities, disorders and injuries to relieve pain, develop or restore functions; prevent muscular deconditioning and maintain maximum performance. Treatment includes the use of exercise, massage, heat, water, light, music, art or electricity as prescribed by a physician.

**Respiratory Therapists (Respiratory Care Practitioners; Inhalation Therapists; etc.):** Set up and operate various types of equipment, such as ventilators, oxygen tents, resuscitators and incubators to administer oxygen and other gases to patients.

**Occupational Therapists (Industrial Therapists, etc.):** Plan, organize and participate in medically oriented occupational program in hospital or similar institution to rehabilitate patients who are physically or mentally ill.

**Physical Therapists (Physiotherapists; Pediatric Physical Therapists; Pulmonary Physical Therapists, etc.):** Apply techniques and treatments that help relieve pain, increase the patient's strength and decrease or prevent deformity and crippling.

**Corrective and Manual Arts Therapists:** Corrective Therapists: Apply techniques and treatment designed to prevent muscular deconditioning resulting from long convalescence or inactivity due to chronic illness. Manual Arts Therapists: Instruct patients in prescribed manual arts activities to prevent anatomical and physiological deconditioning and to assist in maintaining, improving or developing work skills.

**Speech-Language Pathologists and Audiologists (Speech Therapists; Speech Clinicians; etc.):** Examine and provide remedial services for persons with speech and hearing disorders and perform research related to speech and language problems.

**Recreational Therapists (Therapeutic Recreation Specialists; etc.):** Plan, organize and direct medically approved recreation programs for patients in hospitals, nursing homes or other institutions. Activities include sports, trips, dramatics, social activities and arts and crafts.

**Radiation Therapists:** Administer radiation therapy treatments according to prescription and instruction of a physician.

Health Service and Related Occupations: Includes persons who assist and work under the direction of Physicians, Dentists, Nurses, Therapists, Pharmacists and other health related professional, paraprofessional and technical workers. Workers in these occupations provide auxiliary services, such as assisting in the care of patients, relieving nurses of heavier work, preparing treatment rooms, transporting patients, assisting therapists and mixing pharmaceutical preparations.

**Dental Assistants:** Assist Dentist at chair, set up patient and equipment, keep records and perform related duties as required.

**Medical Assistants (Optometric Assistants; Ophthalmic Medical Assistants; Podiatric Assistants; etc.):** Perform various duties under the direction of physician in examination and treatment of patients. Prepare treatment room, inventory supplies and instruments and set up patient for attention of physician. Hand instruments and materials to physician as directed. May schedule appointments, keep medical records or perform secretarial duties.

**Nursing Aides, Orderlies and Attendants (Transporters); etc.:** Work under the direction of nursing or medical staff to provide auxiliary services in care of patients. Perform duties such as answering patient's call bell, serving and collecting food trays and feeding patients. Orderlies are primarily concerned with setting up equipment and relieving nurses of heavier work.

**Home Health Aides:** Care for elderly, convalescent or handicapped person in home of patient. Perform duties for patient such as changing bed linen; preparing meals; assisting in and out of bed; bathing, dressing and

grooming; and administering oral medications under doctor's orders or direction of nurse.

**Psychiatric Aides (Mental Retardation Aides; etc.):** Assist mentally disabled patients working under direction of nursing and medical staff.

**Physical and Corrective Therapy Assistants and Aides:** Prepare patient and/or administer physical therapy treatment, such as massages, heat, light and sound treatment and traction. Instruct, motivate and assist patients with learning and improving functional activities. Normally work under the direction of a Physical or Corrective Therapist.

**Occupational Therapy Assistants and Aides:** Assist Occupational Therapists in administering medically oriented occupational program to assist in rehabilitating patients in hospitals and similar institutions.

**Ambulance Drivers and Attendants:** Drive ambulance or assist ambulance driver in transporting sick, injured or convalescent persons. Assist in lifting patients and rendering first aid. May be required to have Red Cross first-aid training certificate.

**Pharmacy Assistants (Pharmacy Helpers; etc.):** Mix pharmaceutical preparations under direction of Pharmacist. Duties include issuing medicine, labeling and storing supplies, and cleaning equipment and work areas.

# MASSACHUSETTS
# JOB TRAINING PARTNERSHIP ACT (JTPA)
# SERVICE DELIVERY AREAS

Governor Michael S. Dukakis

Alden Raine
Secretary of Economic Affairs

James F. French, Commissioner
Department of Employment and Training
Charles F. Hurley Building, 3rd Floor
19 Staniford Street
Boston, MA 02114
617/727-6600

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**SDA:** Berkshire

**EXECUTIVE OFFICE:** Berkshire Training & Employment Program
400 Columbus Avenue
Pittsfield, MA 01201
413/499-2220

**MUNICIPALITIES SERVED:** Adams, Alford, Becket, Cheshire, Clarksburg, Dalton, Egremont, Florida, Great Barrington, Hancock, Hinsdale, Lanesborough, Lee, Lenox, Monterey, Mount Washington, New Ashford, New Marlborough, North Adams, Otis, Peru, Pittsfield, Richmond, Sandisfield, Savoy, Sheffield, Stockbridge, Tyringham, Washington, West Stockbridge, Williamstown, Windsor

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**SDA:** Boston

**EXECUTIVE OFFICE:** Mayor's Office of Jobs & Community Services
43 Hawkins Street
Boston, MA 02114
617/720-1400

**MUNICIPALITIES SERVED:** Boston

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**SDA:** Bristol

**EXECUTIVE OFFICE:** Bristol County Training Consortium
162 Pleasant Street
Fall River, MA 02721
508/675-1161

**MUNICIPALITIES SERVED:** Attleboro, Berkley, Dighton, Fall River, Mansfield, North Attleboro, Norton, Raynham, Rehoboth, Seekonk, Somerset, Swansea, Taunton, Westport

SDA: Brockton

EXECUTIVE OFFICE: Brockton Area PIC
PO Box 2278
45 Oakdale Street
Brockton, MA 02403
508/584-1887

MUNICIPALITIES SERVED: Abington, Avon, Bridgewater, Brockton, Easton, East Bridgewater, Hanson, Stoughton, West Bridgewater, Whitman

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SDA: Franklin/Hampshire

EXECUTIVE OFFICE: Franklin/Hampshire Employment & Training Consortium
180 Laurel Street
Greenfield, MA 01301
413/774-3182

MUNICIPALITIES SERVED: Amherst, Ashfield, Athol, Belchertown, Bernardston, Buckland, Charlemont, Chesterfield, Colrain, Conway, Cummington, Deerfield, Easthampton, Erving, Gill, Goshen, Granby, Greenfield, Hadley, Hatfield, Hawley, Heath, Huntington, Leverett, Leyden, Middlefield, Monroe, Montague, New Salem, Northampton, Northfield, Orange, Pelham, Petersham, Phillipston, Plainfield, Rowe, Royalston, Shelburne, Shutesbury, Southampton, South Hadley, Sunderland, Ware, Warwick, Wendell, Westhampton, Whately, Williamsburg, Worthington

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SDA: Hampden

EXECUTIVE OFFICE: Hampden County Employment & Training Consortium
1176 Main Street
Springfield, MA 01101
413/781-6900

MUNICIPALITIES SERVED: Agawam, Blandford, Brimfield, Chester, Chicopee, East Longmeadow, Granville, Hampden, Holland, Holyoke, Longmeadow, Ludlow, Monson, Montgomery, Palmer, Russell, Southwick, Springfield, Tolland, Wales, Westfield, West Springfield, Wilbraham

SDA: Lower Merrimack Valley

EXECUTIVE OFFICE: City of Lawrence
Department of Training & Development
237 Essex Street
Lawrence, MA 01840
508/683-9963

MUNICIPALITIES SERVED: Amesbury, Andover, Boxford, Georgetown, Groveland, Haverhill, Lawrence, Merrimack, Methuen, Newbury, Newburyport, North Andover, Rowley, Salisbury, West Newbury

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SDA: Metro North

EXECUTIVE OFFICE: Employment Resources, Inc.
432 Columbia Street
Cambridge, MA 02141
617/494-1154

MUNICIPALITIES SERVED: Arlington, Belmont, Burlington, Cambridge, Chelsea, Everett, Malden, Medford, Melrose, North Reading, Reading, Revere, Somerville, Stoneham, Wakefield, Watertown, Wilmington, Winchester, Winthrop, Woburn

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SDA: Metro South/West

EXECUTIVE OFFICE: Metro South/West Employment & Training
Administration
100 Westover Parkway, PO Box 740
Norwood, MA 02062
617/769-4120

MUNICIPALITIES SERVED: Acton, Ashland, Bedford, Bellingham, Boxborough, Brookline, Canton, Carlisle, Concord, Dedham, Dover, Framingham, Foxborough, Holliston, Hopkinton, Hudson, Lexington, Lincoln, Littleton, Marlborough, Maynard, Medfield, Medway, Millis, Natick, Needham, Newton, Norfolk, Norwood, Plainville, Sharon, Sherborn, Southborough, Stow, Sudbury, Walpole, Waltham, Wayland, Wellesley, Weston, Westwood, Wrentham

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**SDA:** New Bedford, Cape Cod & Islands

**EXECUTIVE OFFICE:** Job Training and Employment Corp.
181 Hillman Street, PO Box A-2102
New Bedford, MA 02741
508/999-3161

**MUNICIPALITIES SERVED:** Acushnet, Barnstable, Bourne, Brewster, Chatham, Chilmark, Dartmouth, Dennis, Eastham, Edgartown, Fairhaven, Falmouth, Freetown, Gay Head, Gosnold, Harwich, Lakeville, Marion, Mashpee, Mattapoisett, Nantucket, New Bedford, Oak Bluffs, Orleans, Provincetown, Rochester, Sandwich, Tisbury, Truro, Wareham, Wellfleet, West Tisbury, Yarmouth

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**SDA:** Northern Middlesex

**EXECUTIVE OFFICE:** Office of Employment & Training
206 Jackson Street
Lowell, MA 01852
508/459-2336

**MUNICIPALITIES SERVED:** Billerica, Chelmsford, Dracut, Dunstable, Lowell, Tewksbury, Tyngsborough, Westford

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**SDA:** Northern Worcester

**EXECUTIVE OFFICE:** Montachusett Employment and Training Program
80 Erdman Way
Leominster, MA 01453
508/632-3341

**MUNICIPALITIES SERVED:** Ashburnham, Ashby, Ayer, Barre, Berlin, Bolton, Clinton, Fitchburg, Gardner, Groton, Harvard, Hubbardston, Lancaster, Leominster, Lunenburg, Pepperell, Princeton, Shirley, Sterling, Templeton, Townsend, Westminster, Winchendon

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**SDA:** South Coastal

**EXECUTIVE OFFICE:** South Coastal Career Development Administration
11 Hayward Street
North Quincy, MA 02171
617/328-7300

**MUNICIPALITIES SERVED:** Braintree, Carver, Cohasset, Duxbury, Halifax, Hanover, Hingham, Holbrook, Hull, Kingston, Marshfield, Middleborough, Milton, Norwell, Pembroke, Plymouth, Plympton, Quincy, Randolph, Rockland, Scituate, Weymouth

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**SDA:** Southern Essex

**EXECUTIVE OFFICE:**
North Shore Employment Training
20 Wheeler Street
Lynn, MA 01902
617/595-0484

**MUNICIPALITIES SERVED:** Beverly, Danvers, Essex, Gloucester, Hamilton, Ipswich, Lynn, Lynnfield, Manchester, Marblehead, Middleton, Nahant, Peabody, Rockport, Salem, Saugus, Swampscott, Topsfield, Wenham

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**SDA:** Southern Worcester

**EXECUTIVE OFFICE:**
City Manager's Office of Employment and Training
22 Front Street, PO Box 76
Worcester, MA 01614
508/799-1590

**MUNICIPALITIES SERVED:** Auburn, Blackstone, Boylston, Brookfield, Charlton, Douglas, Dudley, East Brookfield, Grafton, Hardwick, Holden, Hopedale, Leicester, Mendon, Milbury, Milford, New Braintree, Northbridge, Northborough, North Brookfield, Oakham, Oxford, Paxton, Rutland, Shrewsbury, Southbridge, Spencer, Sturbridge, Sutton, Upton, Uxbridge, Warren, Webster, Westborough, West Brookfield, Worcester

## MASSACHUSETTS OPPORTUNITY JOB CENTERS (OJCs)

### The Training and Employment Directory (TED)

The Training and Employment Directory (TED) is an easy-to-use, self-service computer. Job seekers can view over 25,000 job listings and training opportunities by geographic region and occupational category or vocational training area. Individual job listings include a brief job description, hourly wage or salary requirements, and experience requirements. Training courses are listed by topic and include information about educational requirements and course duration. When job seekers find listings in which they are interested, they discuss each opportunity with a Department of Employment and Training (DET) job specialist who gives them specific information about the employer or training course. TED is available at local Opportunity Job Centers which are listed below:

### Greater Boston Region

| | |
|---|---|
| Boston | 19 Staniford Street, 1st Floor<br>Boston, MA 02114<br>617/727-6320 |
| Cambridge | 806 Massachusetts Avenue<br>Cambridge, MA 02139<br>617/864-1950 |
| Chelsea | 121 Webster Avenue<br>Chelsea, MA 02150<br>617/884-5850 |
| Framingham | 45 Park Street<br>Framingham, MA 01701<br>508/875-5237 |
| Malden | 200 Pleasant Street<br>Malden, MA 02148<br>617/322-8890 |
| Marlboro | 11 Florence Street, Box 37<br>Marlborough, MA 01752<br>508/485-8711 |
| Norwood | 17 Central Street<br>Norwood, MA 02062<br>617/762-9450 |
| Roxbury | 1 Marvin Street<br>Roxbury, MA 02119<br>617/442-4050 |
| Waltham | 119 School Street, Box 9043<br>Waltham, MA 02154<br>617/899-9340 |

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|---|---|
| Woburn | 10 Park Street<br>Woburn, MA 01801<br>617/935-4654 |

**Northeastern Massachusetts Region**

| | |
|---|---|
| Gloucester | 18 Washington Street<br>Gloucester, MA 01930<br>508/283-4772 |
| Haverhill/Newburyport | 15 Green Street<br>Newburyport, MA 01950<br>508/462-4494 |
| Lawrence | 444 Canal Street<br>Lawrence, MA 01840<br>508/682-5217 |
| Lowell | 291 Summer Street<br>Lowell, MA 01853<br>508/458-4641 |
| Lynn | 52-62 Market Street<br>Lynn, MA 01901<br>617/593-5504 |
| Salem | 1 Salem Green, 3rd Floor<br>Salem, MA 01970<br>508/745-1860 |

**Southeastern Massachusetts Region**

| | |
|---|---|
| Attleboro | 67 Mechanic Street, Box 978<br>Attleboro, MA 02703<br>508/222-1950 |
| Brockton | 25 White Avenue, Box 1588<br>Brockton, MA 02401<br>508/586-8100 |
| Fall River | 162 Pleasant Street, Box 470<br>Fall River, MA 02722<br>508/679-9200 |
| Hyannis | 77 High School Road Ext.<br>Hyannis, MA 02601<br>508/775-5800 |
| New Bedford | 618 Acushnet Avenue<br>New Bedford, MA 02740<br>508/999-2361 |

| | |
|---|---|
| Plymouth | 40 Industrial Park Road<br>Plymouth, MA 02360<br>508/746-5910 |
| Quincy | 1 Billings Road<br>North Quincy, MA 02171<br>617/471-2750 |
| Taunton | 72 School Street<br>Taunton, MA 02780<br>508/824-1301 |
| Wareham | 3086 Cranberry Highway<br>PO Box 286<br>Buzzards Bay, MA 02532<br>508/295-1784 |
| Providence, RI | 24 Mason Street<br>Providence, RI 02903<br>401/277-3743 |

**Central Massachusetts Region**

| | |
|---|---|
| Clinton | Town Hall<br>242 Church Street, 2nd Floor<br>Clinton, MA 01510<br>508/365-4452 |
| Dudley | 13 West Main Street<br>Dudley, MA 01570<br>508/943-1240 |
| Fitchburg | 120 Main Street<br>Fitchburg, MA 01420<br>508/343-6461 |
| Gardner | 55 Lake Street, Box 156<br>Gardner, MA 01440<br>508/632-5050 |
| Milford | 14 Beach Street<br>Milford, MA 01757<br>508/478-4300 |
| Sturbridge | 6 Brochu Street<br>Southbridge, MA 01550<br>508/765-5252 |
| Worcester | 49 Myrtle Street<br>Worcester, MA 01608<br>508/791-8551 |

Western Massachusetts Region

| | |
|---|---|
| Athol | 584 Main Street<br>Athol, MA 01331<br>508/249-7130 |
| Chicopee | 355 Front Street, Box 270<br>Chicopee, MA 01013<br>413/598-8371 |
| Greenfield | 31 Federal Street<br>Greenfield, MA 01301<br>413/774-4361 |
| Holyoke | 100 Front Street, Box 6260<br>Holyoke, MA 01041<br>413/538-8216 |
| North Adams | 85 Main Street, Box 937<br>North Adams, MA 01247<br>413/663-3748 |
| Northampton | 243 King Street, Box 388<br>Northampton, MA 01061<br>413/586-3116 |
| Pittsfield | 46 Summer Street, Box 1849<br>Pittsfield, MA 01202<br>413/499-1793 |
| Springfield | 1592 Main Street<br>Springfield, MA 01103<br>413/785-5357 |